

Implementing Spotlight Support in Entourage

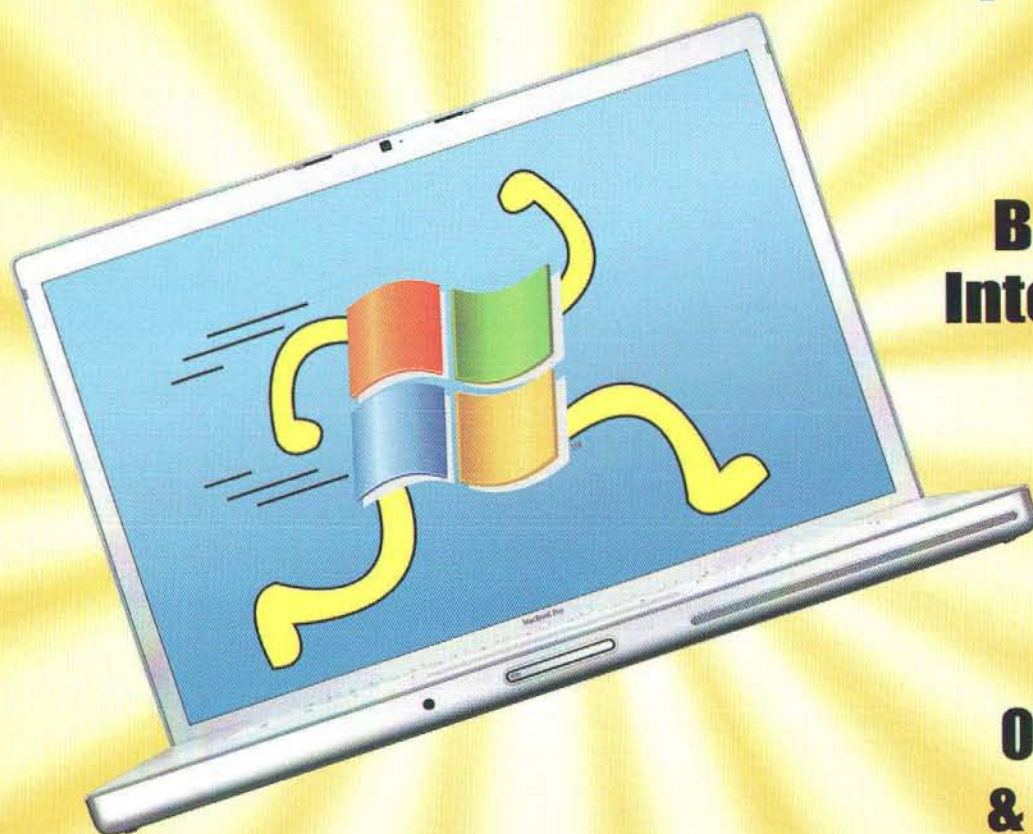
MacTech Magazine
May • 2006

MACTECH[®]

The Journal of Macintosh Technology

How to get Windows running on the Mac: Your many options

by Dean Shavit



**Office 2004
Benchmarks on
Intel-based Macs**

**Introduction to
Scripting Fetch**

**OS X Investigation
& Troubleshooting**

\$8.95 US,
\$12.95 Canada
ISSN 1067-8360
Printed in U.S.A.





Lasso Professional Server 8.5

Universal Binary for Intel Macs:

Native support for
the best speed
and compatibility.

Includes AJAX Tags and Functions:

Supports Web 2.0
techniques for modern,
dynamic Web design.

Built-in LDAP Integration:

Integrate Lasso
with office data
and login systems.

Connect to Any Database:

Including Oracle,
PostgreSQL, MySQL,
FileMaker, ODBC, and JDBC.

Improved DNS, Email, iCal Support:

Extending Lasso's support
for Internet protocols and
open standards.

4 FREE well commented Lasso solutions to get you started:

Blog: Teaches beginners and advanced users
alike how to create an online diary, or web log.

QuickPoll: Add a poll to your Web site with a
question and answers, cast a vote or see results.

Collaborate: Enables knowledge sharing among
a group of developers and administrators to
streamline Web site development from remote
locations or geographically dispersed teams.

Message Board: Source code for the
Message Board solution is completely
open and expandable to suit your needs.

SPECIAL OFFER FOR MACTECH READERS

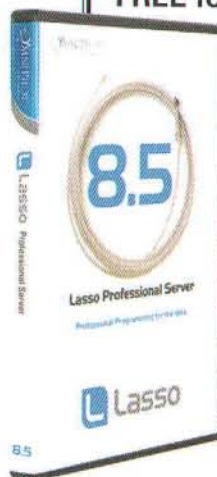
Try Lasso Professional Server 8.5
FREE for 30 days.

www.TryLasso.com

lassosales@omnipilot.com

800-678-9958

Then get 60 days of FREE
support with your purchase.



'Poof! Three months of work gone because I hit the wrong key.'

Just because it's gone,
doesn't mean it's gone for
good. Get the hardest working
data recovery software for
Mac OS X on the job.

FileSalvage™ can undelete files
from your hard drive, digital
camera or iPod.

Even if you've accidentally
formatted it or your drive is
corrupted ... you can still
get your important files back.

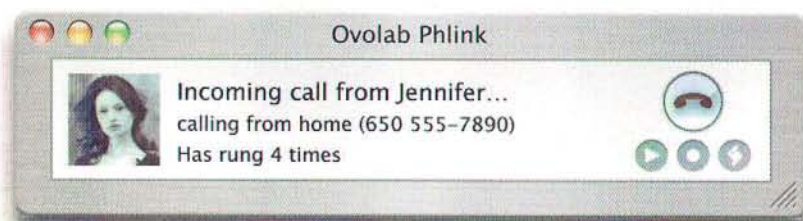
See for yourself
Visit www.SubRosaSoft.com
for more information.



FILESALVAGE™

SUBROSA.COM

Look who's talking.



And record all your conversations. And play them back. And a whole lot more.



Ovolab Phlink is the ultimate message center for your Mac. It **answers** phone calls and identifies callers using Caller ID and Apple's Address Book. It greets your friends with personalized messages. It **records** and stores messages on your computer – and even forwards voicemail to **email** as AAC audio attachments. Featuring multiple **voice mailboxes**, high-quality audio, Spotlight searching and fax capabilities, Ovolab Phlink makes

your telephone part of the digital hub! And you can fully customize Ovolab Phlink to do exactly what you need, using AppleScript: even set it up to call you back on your cell phone when important clients leave a message. Check it out now at www.ovolab.com.

OVO^{LAB}
software for the creative mind



TABLE OF CONTENTS

ARTICLES & DEPARTMENTS

Mac In The Shell

OS X Investigation and Troubleshooting

The Secrets to OS X success

by Edward Marczak 6

Microsoft | Mac in the Enterprise

Entourage 2004 Spotlight Support

An IT Perspective: How Microsoft Entourage 2004 now takes advantage of Spotlight

by Brian Johnson and Andy Ruff 14

MacTech Labs

Office 2004 Benchmarks on Intel-based Macs

by the MacTech Editorial Staff 22

The Source Hound

Found in Transition:

Windows and Mac, sitting in a tree...

by Dean Shavit 32

Tweak Tiger's TFTP

by Aaron Adams 52

Kool Tools

ATEN's MasterView Max (CS1758) KVM Switch

by MacTech Staff 54

AppleScript Essentials

An Introduction to Scripting Fetch

by Benjamin S. Waldie 60

A TOURIST'S PHOTOS OF NEW YORK

COMPRESSED BY

STUFFIT DELUXE

SOFTWARE FOR MAC/PC

Communicate With Us

Department E-Mails

**Orders, Circulation, &
Customer Service**
cust_service@mactech.com

Press Releases
press_releases@mactech.com

Ad Sales
adsales@mactech.com

Editorial
editorial@mactech.com
(Authors only, no pr)

Accounting
accounting@mactech.com

Marketing
marketing@mactech.com

General
info@mactech.com

Web Site
<http://www.mactech.com>

.....

In this electronic age, the art of communication has become both easier and more complicated. Is it any surprise that we prefer **e-mail**?

If you have any questions, feel free to call us at 805/494-9797 or fax us at 805/494-9798.

If you would like a subscription or need customer service, feel free to contact MacTech Magazine Customer Service at 877-MACTECH

.....

We love to hear from you! Please feel free to contact us with any suggestions or questions at any time.

Write to letters@mactech.com or editorial@mactech.com as appropriate.

MACTECH[®]

The Journal of Macintosh Technology

A publication of **XPLAIN** CORPORATION

The Editorial Staff

Publisher & Editor-in-Chief: Neil Ticktin

Associate Publisher : David Sobsey

Executive Editor: Edward R. Marczak

Editor-at-Large: Dave Mark

Business Editor: Andrea Sniderman

Editor-at-Large, Open Source: Dean Shavit

Managing Editor: Dennis Bower

Copy Editor: Marianne Shilpa Jacobie

Staff Writer: Dharmendra Rai

Xplain Corporation Senior Staff

Chief Executive Officer: Neil Ticktin

President: Andrea J. Sniderman

Accounting: Marcie Moriarty

Customer Relations: Susan Pomrantz

Board of Advisors: Steven Geller, Alan Carsrud

Regular Columnists

QuickTime Toolkit: by Tim Monroe

Patch Panel: by John C. Welch

The Source Hound: by Dean Shavit

Reviews/KoolTools: by Michael R. Harvey

AppleScript Essentials: by Ben Waldie

Mac In The Shell: by Ed Marczak

Board of Advisors

Chairman: Dave Mark,

Jordan Dea-Mattson, Steven Geller, Bruce Friedman, and Richard Kimes

Contributing Editors

Michael Brian Bentley, Gordon Garb, Vicki Brown, Chris Kilbourn

Marshall Clow, Rich Morin, Will Porter, Tom Djajadiningrat, Avi Rappoport,

Andrew S. Downs, Cal Simone, Steve Sisak

MacTech Magazine (ISSN: 1067-8360 / USPS: 010-227) is published monthly by Xplain Corporation, 850-P Hampshire Road, Westlake Village, CA 91361-2800. Voice: 805/494-9797, FAX: 805/494-9798. Domestic subscription rates are \$47.00 per year. Canadian subscriptions are \$59.00 per year. All other international subscriptions are \$97.00 per year. Domestic source code disk subscriptions are \$77 per year. All international disk subscriptions are \$97.00 a year. Please remit in U.S. funds only. Periodical postage is paid at Thousand Oaks, CA and at additional mailing office.

POSTMASTER: Send address changes to **MacTech Magazine**, P.O. Box 5200, Westlake Village, CA 91359-5200.

All contents are Copyright 1984-2006 by Xplain Corporation. All rights reserved. MacTech and Developer Depot are registered trademarks of Xplain Corporation. RadGad, Useful Gifts and Gadgets, Xplain, DevDepot, Depot, The Depot, Depot Store, Video Depot, Movie Depot, Palm Depot, Game Depot, Flashlight Depot, Explain It, MacDev-1, THINK Reference, NetProfessional, NetProLive, JavaTech, WebTech, BeTech, LinuxTech, MacTech Central and the MacTutorMan are trademarks or service marks of Xplain Corporation. Sprocket is a registered trademark of eSprocket Corporation. Other trademarks and copyrights appearing in this printing or software remain the property of their respective holders.

OS X INVESTIGATION AND TROUBLESHOOTING

THE SECRETS TO OS X SUCCESS

"How did you *know* that?" A question I'm often asked. Usually right after pulling out some arcane bit of OS X knowledge. Now, I hardly know everything – far, far from it. But, I try to stay a little ahead of the curve. What you're reading now is part 1 of a multi-part column on learning the depths of OS X. Of course, the deeper you dig, the more quickly you can troubleshoot the system. At the end, I hope you will have picked up some new tips and tricks. Of course, we need to begin at the beginning.

The Basics

One of the first things I like to install on my own machines is Tripwire (this, by the way, goes for end-user stations and servers). Long known as a security tool, a tripwire will take a snapshot of file system, and then report any changes made to that system. From a security perspective, that's incredibly important; especially when you see something change in an area that shouldn't ever change! It is also a great way to learn about your Mac. What changes every day? Did the patch to your software install exactly what it claims? (And that's it...I'm not going to launch into the history of the product this time!)

Currently, I run the "Tripwire" tripwire (there are others out there). You can download an OS X binary from <http://www.macguru.net/~frodo/Tripwire-osx.html>. Go forth, download and install. Once you've installed it, the tricky part is the configuration and setup, and that's what I'll cover here. But, I will breeze through the install.

Please note that the binaries in the download are PPC only. If you're on an Intel Mac, grab the source, and compile it up yourself. Who knows, there may be a pre-packaged version somewhere by the time this column runs.

This is a *full* command-line install, so fire up Terminal.app (or iTerm, or...). Uncompress the tarball,

get root (`sudo bash`, `sudo -s`, `su -`...take your pick), and run `./install.sh`. Press ENTER to read through the license agreement (space, space, space, space, space, space), and agree. Note that:

This program will copy Tripwire files to the following directories:

```
TWBIN: /usr/local/tripwire/bin
TWMAN: /usr/local/tripwire/man
TWPOLICY: /usr/local/tripwire/policy
TWREPORT: /usr/local/tripwire/report
TWDB: /usr/local/tripwire/db
TWSITEKEYDIR: /usr/local/tripwire/key
TWLOCALKEYDIR: /usr/local/tripwire/key
```

Follow the rest of the instructions, and *definitely* initialize the database when asked, even though it will undoubtedly take a while. Tripwire is a deep, and somewhat complex product. I've been using it longer than I can remember on both servers, where I install it with a little more consciousness to security, and my personal workstations. Tripwire usage alone, could take an article or two. A quick Google search turned up this good tutorial - <http://www.weberdev.com/Manuals/rhl-rg-en-80/ch-tripwire.html> - and I recommend you read it, if you want to get into tripwire deeper than I present here. Just remember to adjust paths in your head for the install you just did.

Tripwire operates against a file *policy*. You should notice that all files were installed under `/usr/local`. In `/usr/local/tripwire/policy`, you'll find two files, `tw.pol` and `twpol.txt`. The first, is a signed binary file – the one tripwire uses to run from. The second, is just a text file. To change the policy, you need to sign a text file into a binary using your passphrase. Use `twpol.txt` as a guide. For the most part, the default policy is just dated, and you can comment out anything relating to System 9. Make your changes to your policy, change to the `/usr/local/tripwire/bin` directory and run:

```
# ./twadmin -m P ../policy/twpol.txt
Please enter your site passphrase:
Wrote policy file: /usr/local/tripwire/policy/tw.pol
```

Since this is security software, we can't just allow any change to policy, right? We need to re-initialize the baseline snapshot. So, if you've chosen to do this, run `./tripwire -m i` from the `/usr/local/tripwire/bin` directory and enter your passphrase. *Now* you're using your custom policy. From there, when you run `tripwire -m c`, a report will be output to your terminal and to `/usr/local/tripwire/report`, where you can pick up a text-based report.

Tripwire just gives me that extra happy feeling that I know what's going on with my machine. When applications piggyback on another's install (yes Smart Crash Reports, I'm looking in your direction...), it won't surprise you later on. I would like to share how I automate Tripwire reports, since it may not be entirely obvious. Here's a portion of the shell script that I had perform some nightly maintenance:

```
## Check and report on differences
/usr/local/sbin/tripwire -m c > /var/root/logs/`date`
+%Y%m%d`.txt
## Update the database
echo "*****" >> /var/root/logs/`date`
+%Y%m%d`.txt
/usr/local/sbin/tripwire -m u -a -r
/usr/local/lib/tripwire/report/ls
/usr/local/lib/tripwire/report -P "My Passphrase Here" -v >>
/var/root/logs/`date` +%Y%m%d`.txt
```

First thing that gets done is a report, which is redirected to a file – the name of which is based on the date. Then, after writing a marker to my log, I update the Tripwire database with a new snapshot, so I'm ready for the next night. (You might notice from this snippet that I don't have things in the exact same place you might. So if you want to steal this, make sure you get the paths right!)

While I still do rely on Tripwire for high-level changes, please make note that it's far from perfect in a Macintosh environment – especially with Tiger. Tripwire is slightly aged at this point, and worked well when it arrived on the scene. However, it will miss changes in HFS+ metadata, like keywords for Spotlight and ACL information. Just understand that Tripwire is no longer an ideal security solution for the Mac (if it ever was).

Find Out

The `find` command – something I've been meaning to dig into, in a column somewhere. Sounds simple, right? `find` finds files. However, there's an impressive array of options that let you narrow down the scope of your results. Of course, you can find by name:

```
find . -name "report" -print
```

You have to tell `find` where to begin looking, that's the first "." – start in the current directory. From there, you have to give `find` its criteria. In this case, we're looking for a name. Finally, we have to tell it what to do with the items it finds. Here, we just want it printed to our terminal. That's OK, but not for the purposes of this article. You should hit the man page for all of the options that `find` contains, but we'll look at some practical OS X example usage. Here's one of the more useful ones: find files updated since boot. Since OS X creates the `/mach` file at every boot, we have a great marker to use as a time stamp. If you want to find all files in the `/System` hierarchy that have been updated since boot, use this:

```
# find /System -newer /mach -print
```

On my machine, this currently yields this:

```
/System/Library/Caches/com.apple.kernelcaches
/System/Library/CoreServices/RemoteManagement/ARDAgent.app/Contents/Support
/System/Library/CoreServices/RemoteManagement/ARDAgent.app/Contents/Support/networksetup
/System/Library/CoreServices/RemoteManagement/ARDAgent.app/Contents/Support/systemsetup
```

The `kernelcaches` file comes up because, well, I was fiddling with kernel extensions. The ARD files got modified because I needed to fire up ARD to get back into my machine. (loooooong story why I had to configure and fire up ARD through ssh *on my own machine*...)

If you want to find files that have been modified since a certain time, not necessarily boot, use `touch` to drop a marker, and use `find` against that. Something like this:

```
# touch -t 200601011300.00 marker
# ls -l marker
-rw-r--r-  1 root  wheel  0 Jan  1 13:00 marker
# find / -newer marker -print
```

This will find all files created or modified on my machine since the first of January, 2006, 1pm. Since I suspect that would be a fairly high number, I'll skip the output and leave that as an exercise for the reader.

Of course, with *no* constraints, `find` will just return everything under a certain hierarchy, which comes in handy for quick before and after snapshots. `find /Library -print > ~/liblist.txt` will print out all files in `/Library`, and redirect the output to a file in your home directory named "liblist.txt". Run that before installing software, and again, with a different capture file name, after the software is installed, and compare the two. You'll find any new files that the installer may have dropped into `/Library`.

That's not an exhaustive look at `find`, as it's not the sole focus of this article. But, make no mistake – `find` is incredibly

useful. If you've ever examined the `locate.updatedb` script that runs weekly, you'll see that it builds its database, using `find`. The deeper you dig, the more uses you'll find.

What's da BOM?

Speaking of file tracking and installation, did you know that the Apple installer will happily show you the files it will install before it installs them? Really. Next time you need to install software, look for "Show Files" under the File menu (or press Apple-I). That's part of the package's *bill of materials*. Figure 1 shows the beginning of the bill of materials for Viva Designer.

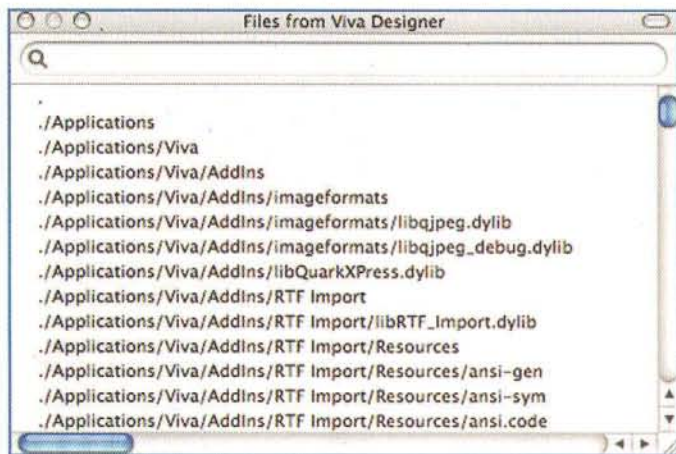


Figure 1: Installer showing a bill of materials

In conjunction with our other techniques above, this is a handy way to see where an installer may want to spray files. Additionally, if you end up running Tripwire, the file changes it reports, should match up with the BOM that an installer presents. If not, someone is lying!

You can also determine the bill of materials from the command-line, if you are installing or inspecting a package remotely. The `lsbom` binary will display the contents of a BOM archive. Witness:

```
$ cd VivaDesigner-Free-5.1.0-4055.pkg/Contents
$ ls -la
total 149696
drwxr-xr-x  7  marczak  marczak    238   Feb 15 11:13 .
drwxr-xr-x  3  marczak  marczak    102   Feb 15 11:13 ..
-r--r--r--  1  marczak  marczak   46540   Feb 15 11:13 Archive.bom
-r--r--r--  1  marczak  marczak  76584362   Feb 15 11:13 Archive.pax.gz
-r--r--r--  1  marczak  marczak   1373   Feb 15 11:13 Info.plist
-r--r--r--  1  marczak  marczak     8   Feb 15 11:13 PkgInfo
drwxr-xr-x 12  marczak  marczak    408   Feb 17 15:34 Resources
$ lsbom Archive.bom
.
 40755  501/80
./Applications 40755 501/80
./Applications/Viva 40777 0/80
./Applications/Viva/AddIns 40777 0/80
./Applications/Viva/AddIns/RTF Import 40777 0/80
./Applications/Viva/AddIns/RTF Import/Resources 40777 0/80
./Applications/Viva/AddIns/RTF Import/Resources/ansi-gen 100666 0/80 3231 2569670117
./Applications/Viva/AddIns/RTF Import/Resources/ansi-sym 100666 0/80 1498 2978768719
./Applications/Viva/AddIns/RTF Import/Resources/ansi.code 100666 0/80 1449 784701331
./Applications/Viva/AddIns/RTF Import/Resources/mac-gen 100666 0/80 3137 1114243711
...
(output clipped for sanity)
```

If you've never looked at the contents of a package, take a look again at the previous listing. `Archive.bom` is the packages bill of materials. `Archive.pax.gz` contains the files themselves! So, if you ever need to grab one file from a package, that's where you can get it from.

Processes

The next-to-last last thing I'm going to delve into this month is the process model of OS X – an important area of understanding for the advanced topics later on. Despite Apple pushing the notion that OS X is Unix, it's not quite, really. It's a mach kernel with Unix-like behavior and APIs. This makes all of that Unix source code compile neatly (mostly), but you're still always operating under the monolithic mach kernel, which does things a little differently than the traditional *BSD, Sys V, and derivative Unix-like works such as Linux and IRIX kernels. All in all, it's a unique mix of a known kernel, a modified BSD Unix that rides on top, and unique parts from Apple that haven't been seen before.

Describing the Mach and microkernel architecture would take a book by itself (one that I would guess exists already), but its foundations are important to understand if we're to troubleshoot deeply. I'm going to run us through the talking points, and the highlights that get us to OS X.

Mach came about after Unix was already in existence. From that perspective, it could see the good points of Unix and use them, and the downsides of Unix and avoid them. Mach was originally developed at Carnegie Mellon University, leapfrogging off of a BSD Unix core. Little by little, Mach replaced parts of the BSD core. To keep compatibility, much of BSD remained in the Mach kernel. Mach v3 moved all BSD code outside of the kernel, resulting in the *microkernel* featured today. The goal of a microkernel architecture allows the kernel to provide a minimal amount of services, and extensions that run up in userland. Interestingly, this provides a system that allows other operating systems to sit on top. That's one of Mach's primary goals: a simple, extensible kernel. Note, finally,

that traditionally, when talking about the kernel, you'd only be referring to the microkernel itself. Apple, with Mac OS X, gets a little more liberal with the definition, as they've forged their own path. When Apple refers to the kernel, that primarily encompasses the Mach kernel, BSD, and I/O Kit. This is done for valid performance reasons.

Here's the important part: Mach's execution environment is called a *task*. Other Unicies (like the

Intego VirusBarrier X4

The acclaimed antivirus program for the Mac

Multi-function Orb

The change in color of the Orb indicates the presence of an infected or damaged file.

Selection

Choose the data to be scanned in the dialog box with a simple click.

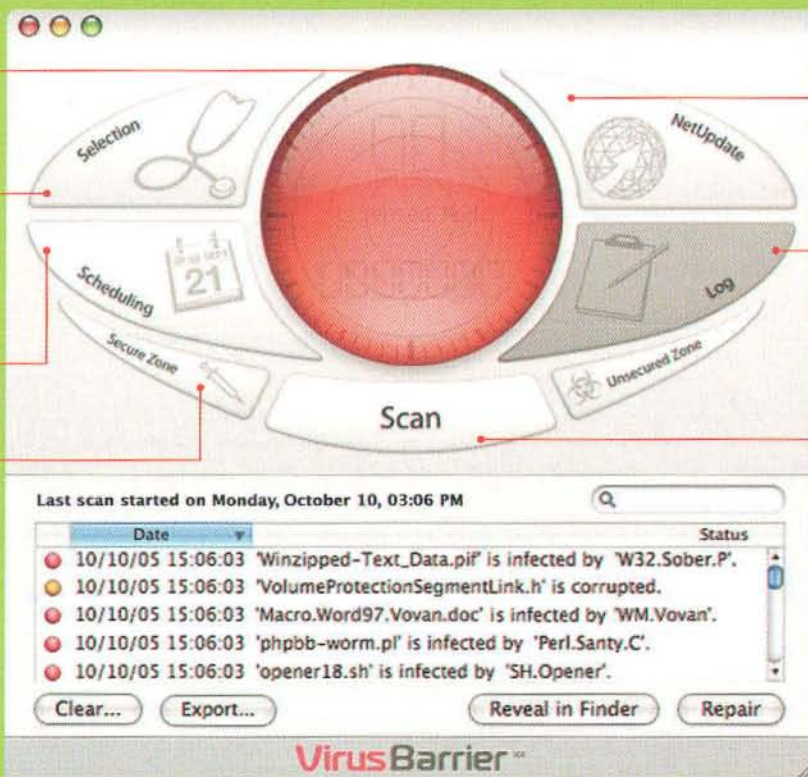
Scheduling

Schedule regular or specific scans of your volumes and view them in Apple's iCal.

Reinforced security zone

Decide for yourself the best level of security for your files and folders.

Protects against the Oompa-Loompa
(OSX/Oomp-A or Leap.A)



NetUpdate X4

Automatically or manually check the availability of updates or virus definitions.

Complete log

Display all analysis logs of your volumes and files with a single click.

Analysis

Turbo Mode technology analyzes your data up to 40 times faster.

For Macs with PowerPC or Intel processors



Intego Widgets

Discover, under Tiger, new Intego Widgets informing you of the status of your protection, the availability of updates, and scheduled events.



Repairs your infected documents

VirusBarrier X4 alerts you to the presence of viruses and repairs damaged or corrupted files.



Your updates with NetUpdate X4

Easily schedule, check and install new virus definitions and updates for all Intego software installed on your Mac.



Main features of VirusBarrier X4

- Detects and eliminates all known viruses
- Repairs infected files
- Turbo Mode technology (up to 40 times faster)
- Simple, effective and non-intrusive
- New dynamic resizable interface
- Scans incoming and outgoing e-mail
- New Intego menu
- VirusBarrier X4 Widget and Intego Widget
- Scheduled scans
- Detailed log
- Reinforced security zone
- Heuristic and behavioral analysis
- Blocks virus execution
- New multi-function Orb
- New alert management
- File analysis by the Intego Virus Monitoring Center
- File creation and modification detection
- Temporary antivirus deactivation
- Easy integration with other Intego programs
- Management of compressed files
- Contextual Menu
- Updates via NetUpdate X4



Apple Store **MacMail** **NAVARRE** **Fry's** **WORLD MUSIC** **www.intego.com**

Intego • 500 North Capital of Texas Hwy, Suite 8-150 - Austin, TX 78746 • Tel (512) 637-0700 • Fax (512) 637-0701 • sales@intego.com

Macintosh, Mac, the Mac logo and Apple logo are registered trademarks of Apple Computer, registered in the US, and other countries. © 2001 - 2005, Intego, the Intego logo, VirusBarrier, the VirusBarrier logo and we protect your world are registered trademarks of Intego, registered in the US and other countries. All other brand and product names are the property of their respective owners. Intego is not responsible for omissions or errors in typography or photography. Photo: Intego



System V, traditionally) break an executing program down into a *process*. A process allows the kernel to keep track of:

- Context – the current location of program execution
- The program's credentials (rights)
- Memory space that the program has allocated/access to

...but that's not exactly what we're interested in. Mach abstracts things a little differently. A task provides the address space for execution. There is no such thing as a "process" in Mach! A *thread* is the basic unit of execution. A thread runs inside a task. *A task does nothing unless it has a thread running inside it.* A task allows communication with the rest of the system via *ports* (these have *nothing* to do with IP ports!). Threads communicate over ports via *messages*.

A task with just one thread running, is similar to a Unix process. The fork system call creates a new process under Unix, and it creates a new task under Mach. So, a task provides virtual memory space, and ports for the threads that

are running inside of it. Tasks and threads can be in only one of two states: running and suspended. Operating on a task affects all threads in the task. Mach allows for kernel tasks and threads, and of course, userland tasks and threads.

There you have it: a ridiculously simplified view of Mach. The important point to take away: A task is either running in the kernel or in userland. Thanks to the BSD roots, and Apple's bundling of BSD in kernel-space, you're still going to see plenty of references to "processes" – don't be confused by that – the BSD in Apple's kernel space still references processes. These are retrofitted into OS X by associating a process to a Mach task.

Listing All Open Files

The last utility I'm going to cover this month wraps up everything we've talked about: *lsdf* (list open files). First, one must remember that Unix treats just about everything as a file. So

this command, if you're not already familiar with it, may do more than you expect. Go on, get a shell and try it. Just type *lsdf* by itself. You got an absolute ton of output, right? Things that certainly don't look like *files*, for sure. If you run this command as root, you get *everything* – everyone else gets a little less. (This is a compile-time option that, thankfully, Apple chose to enable). Specifically, as non-root, you'll only see processes that you have credentials to see. Of course, when troubleshooting, *grep* comes in extra-handy here (and there are plenty of switches that modify *lsdf*'s output). Let's look at a snippet of the files that Word has open, while I type this month's column: (See *Listing 1* at bottom of page.)

(That's only a handful of the 195 files that actually were listed!) What is all of that? Let's look at a shorter listing:

```
$ lsdf | head -7
```

COMMAND	PID	USER	FD	TYPE	DEVICE	SIZE/OFF	NODE	NAME
kernel_ta	0	root	cwd	VDIR	14,2	1360	2	/
launchd	1	root	cwd	VDIR	14,2	1360	2	/
launchd	1	root	txt	VREG	14,2	80112	2471328	/sbin/launchd
launchd	1	root	txt	VREG	14,2	1165460	4986063	/usr/lib/dyld
launchd	1	root	txt	VREG	14,2	4314524	7229742	/usr/lib/libSystem.B.dylib
launchd	1	root	0r	VCHR	3,2	0t0	47460484	/dev/null

The command column lists the name of the process that holds a file open. Well, at least the process' first 9 characters by default. That can be changed with a switch. Next is the PID, or, process ID column. The user column lists the user ID, *or* the ID number of the user that owns the respective process. The remainder of the columns may require a little deeper explanation.

FD is the *file descriptor* number of the file *or* one of the following:

- cwd current working directory
- jld jail directory
- ltx shared library text (code and data)
- Mxx hex memory-mapped type number xx
- mem memory-mapped file
- mmap memory-mapped device

```
$ lsdf | grep -i micro
```

Microsoft	695	marczak	27u	VREG	14,2	0	7553550	/Users/marczak/Library/Caches/TemporaryItems/dftmpLDHHDDAMmkkkkkkk
Microsoft	695	marczak	28u	VREG	14,2	27648	7555738	/private/var/tmp/folders.501/TemporaryItems/Word Work File D_126691561
Microsoft	695	marczak	29u	VREG	14,2	367972	7553957	/private/var/tmp/folders.501/TemporaryItems/Word Work File S_2
Microsoft	695	marczak	30u	VREG	14,2	0	7553981	/Users/marczak/Library/Caches/TemporaryItems/dftmpLDHHDDAMpkkkkkkk
Microsoft	695	marczak	31u	VREG	14,2	0	7556216	/Users/marczak/Library/Caches/TemporaryItems/dftmpLDHHDDAMzkkkkkkk
Microsoft	695	marczak	32u	VREG	14,2	0	7555740	/Users/marczak/Library/Caches/TemporaryItems/dftmpLDHHDDAMukkkkkkk
Microsoft	695	marczak	33u	VREG	14,2	0	7556478	/Users/marczak/Library/Caches/TemporaryItems/dftmpLDHHDDAMlkkkkkk
Microsoft	695	marczak	34u	VREG	14,2	34304	7600057	/private/var/tmp/folders.501/TemporaryItems/Word Work File D_1932939382
Microsoft	695	marczak	35u	VREG	14,2	0	7600059	/Users/marczak/Library/Caches/TemporaryItems/dftmpLDHHDDAMrokkkkkk
Microsoft	695	marczak	36u	VREG	14,2	31232	7556006	/Users/marczak/Documents/Microsoft User Data/Word Work File A_145444510
Microsoft	695	marczak	37u	VREG	14,2	0	7557765	/Users/marczak/Library/Caches/TemporaryItems/dftmpLDHHDDAMolkkkkkk
Microsoft	695	marczak	38u	VREG	14,2	33280	7563303	/Users/marczak/Documents/Microsoft User Data/Word Work File A_464205110
Microsoft	695	marczak	39u	VREG	14,2	32768	7565584	/private/var/tmp/folders.501/TemporaryItems/Word Work File D_526811357
Microsoft	695	marczak	40u	VREG	14,2	0	7565586	/Users/marczak/Library/Caches/TemporaryItems/dftmpLDHHDDAMwlkkkkkk
Microsoft	695	marczak	41u	VREG	14,2	0	7565585	/Users/marczak/Library/Caches/TemporaryItems/dftmpLDHHDDAMvllkkkkkk
Microsoft	695	marczak	42u	VREG	14,2	141	7599967	/private/var/tmp/folders.501/TemporaryItems/Word Work File D_1924866124

Listing 1.

- pd parent directory
- rtd root directory
- txt program text (code and data)

The file descriptor number may be followed by a character (see the final line in the example listing above), which has the meaning:

- r – file is open for read.
- w – file is open for write.
- u – file is open for read/write.
- space (no character) – unknown mode, no lock character.
- (hyphen) – unknown mode and lock character follows.

The lock character will be one of the following:

- N for an NFS lock of unknown type;
- r for read lock on part of the file;
- R for a read lock on the entire file;
- w for a write lock on part of the file;
- W for a write lock on the entire file;
- u for a read and write lock of any length;
- U for a lock of unknown type;

The type column lists what type of file is open. While *ls* can report on many different types, it makes the most sense to concentrate on the types you'll see most:

FIFO – A FIFO pipe. Much like a regular pipe, but operates as part of the file system and can be accessed by multiple

processes. *man 1 mkfifo*, if you need to know.

IPv4 – An open IPv4 socket.

IPv6 – An open IPv6 file.

KQUEUE – A kernel event queue file. *man 2 kevent* if you're really interested.

PIPE – An open unix pipe.

PSXSEM – Posix semaphore file. A semaphore is like a lock, but with a little more control. With a semaphore, more than one thread can be performing a given operation at once, whereas a lock will restrict operations to a single thread.

PSXSHM – Posix shared memory.

VCHR – a character device.

VDIR – a directory on the filesystem.

VREG – a regular file on the filesystem.

VGER – that thing from Star Trek (oh, wait...you won't see that in *ls*).

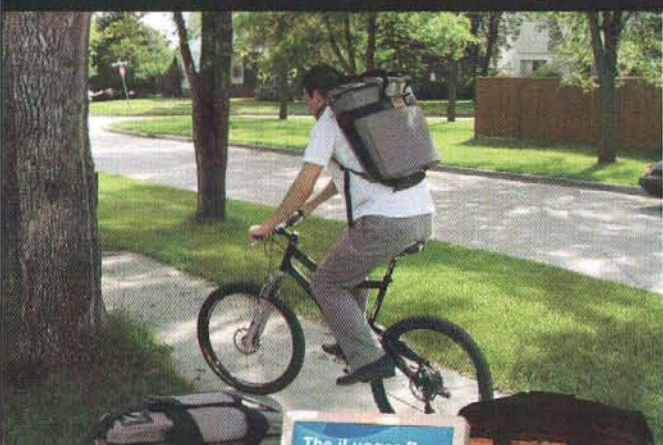
LINK – a symbolic link.

system – a system domain socket.

unix – a unix domain socket.

The device column is an important one: it tells you which device said file is open on. On OS X, possibly not a big deal as you may be running with a single disk (as I am on my PowerBook at the moment). However, OS X Server may present you with more possibilities (as I hope you're separating the system and user data on a server...but that's another article). The listed 'device' may look a little odd. In some cases, it will be a memory address (in the case of PSXSHM, for example). Files and directories will list the

There are times when you have to take your desktop with you...



iLUGGER Bags
for ALL G5 and Intel iMacs

Pro Series Bags



G5
Tower
Lugger



23"
Cinema
Lugger

NEW!



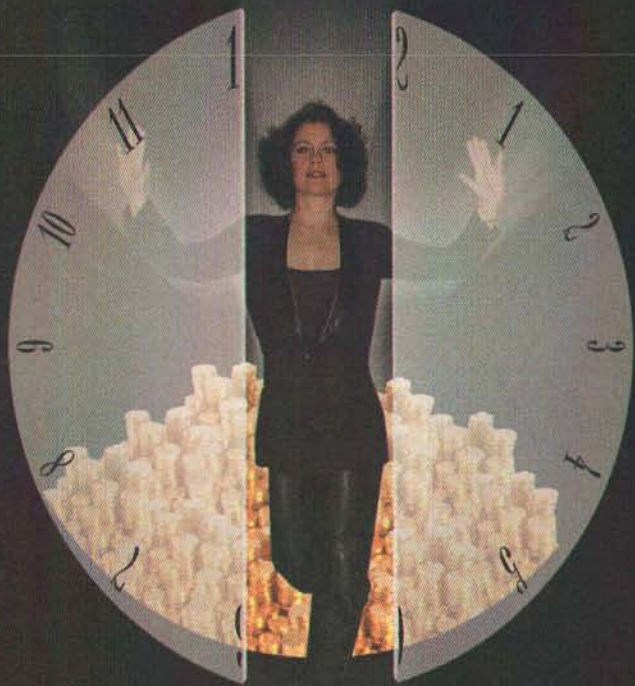
30"
Cinema
Lugger

If you need uncompromising performance **To Go**
Call us or visit our website

LTA PROJECTS • www.ilugger.com • 877-897-5158 ext 2

JobCapture

Automatic Time and Expense Tracking Software



JobCapture is intuitive, user-friendly client-server software that intelligently and automatically tracks working time and activity. Open a document in any application, and it is automatically being timed by JobCapture. This guarantees that *all work activity is recorded*.

- Perfect for ad agencies, design studios, architects, law firms, PR Firms etc.
- Scalable. Flexible.
- Easy to configure.
- Cost effective. Adding additional users is easy and inexpensive.
- Tracks time and expenses.
- Client and Server software is included.
- Easily customized.
- Real-time data delivery.
- Customizable reporting.
- View data numerically or graphically.
- Import/Export data to SQL, MySQL, XML etc.

JobCapture will *increase productivity and your bottom line* by providing accurate records for billing and analysis. *Stop losing money now—Call today for more information: 973.763.9494. Reps are available 10:00am-5:30pm, EST.*

www.captureworks.com



device node number. A device node number looks something like this: 14, 2 – it is listed in the size column. Perhaps this pleads for further explanation.

Device files live in the /dev directory. Take a peek in there and you'll see files that are pretty much like none other on the system. In the permissions column, where you'd expect to either find a 'd' denoting a directory, or a '-' denoting a file, we see instead a 'c' or 'b'. Those represent character or block devices. A character, or *raw*, device is something like a tty (teletype terminal – what you're using when you fire up Terminal or ssh into another machine). A block device is typically used for a disk or tape device (OK, I still wish OS X had raw tape support...). Without getting too deep into this, a block device gets a buffer assigned by the kernel, and allows you to perform non-sequential access. A character device typically gets used where you'd be reading a stream of information (like from a serial port). What about those crazy numbers?

The numbers in the size column are called the devices *major* and *minor* numbers. All of these device entries represent device drivers. The actual driver is either compiled into the kernel (/mach_kernel) or loaded as an extension. The /dev entry is just a pointer to the driver in kernel space. Just because there is an entry in /dev, does not mean that there's a corresponding driver in the kernel. The major number represents the kind of device, while the minor number represents the specific part of that device we're interested in. Let's take a look at some examples:

```
brw-r-- 1 root operator 14, 0 Mar 7 16:40
disk0
br-r-- 1 root operator 14, 1 Mar 7 16:40
disk0s1
brw-r-- 1 root operator 14, 2 Mar 7 16:40
disk0s3
```

From this listing, we can immediately see that disk0, disk0s1, and disk0s3 are all block devices with major number 14. Notice what differentiates each of the devices: the minor number – representing a different slice on the disk. Let's look at another snippet:

```
crw-w-- 1 root tty 4, 0 Mar 7 16:42 tty0
crw-w-- 1 marczak tty 4, 1 Mar 14 06:26 tty1
crw-w-- 1 marczak tty 4, 2 Mar 7 16:46 tty2
crw-w-- 1 marczak tty 4, 3 Mar 13 19:20 tty3
```

Not only can we immediately see that these are character devices, but, as expected, have a different major number. Once again, the differentiating factor for each of the tty entries is the minor number, each addressing a different tty.

Take away this: entries in /dev are not device drivers, nor are they code, but rather, they are simple pointers. Creating an entry in /dev does not create code in the kernel to support the device. You create these special

WWW.MACTECH.COM

entries with `ls -l /dev | grep "14, *2"`. Of course, how does this fit into our discussion about `ls -l`? You'll notice that many times in a listing, the device entry will be a major and minor combination. Now you know what that means! Just go look it up in `/dev` if things aren't adding up. In my case, I have many files open on 14,2. So, I'd do this:

```
# ls -l /dev | grep "14, *2"
brw-r--r-- 1 root operator 14, 2 Mar 7 16:40 disk0s3
crw-r--r-- 1 root operator 14, 2 Mar 7 16:40 rdisk0s3
```

Ah, of course! That makes sense: 14,2 represents my main (and only, at the moment) disk.

Following the device column is the "Size/Off" column. This column shows the size of the file opened, if it is an actual file, the offset into the file, depending on the file type – look for the 0t or 0x prefix – or, possibly no value if `ls -l` can't make a determination, or, is not appropriate.

The next-to-last column is "Node". This will list the file's node number on a local disk, the inode of an NFS file, the Internet protocol type, or possibly nothing, depending on the file type.

We made it! Whew! Last column: Name. This is yet another column whose contents will change based on what type of file is being displayed, and there are many possibilities. I'm going to cover ones that you're most likely to see. For a regular file or directory, the full path name to the file or directory will be displayed. In other cases, we may be looking at a block or character device. Network connections will be listed with appropriate information.

Now, `ls -l` is an incredible utility. Do understand that we're lucky that Apple includes it with OS X: `ls -l` is *not* included with most Unix distributions. It's not a "built-in," rather; it's an add-on. As such, it works its magic by digging in where it can, making inferences and generally peeking where most utilities don't. It works slightly differently on different varieties of Unix. What I'm getting at here is that it may not be 1000% accurate. Don't let that fill you with doubt, though, as it does a better job than anything out there, really. But there may be a minority of situations where it just doesn't pull up a file, or grabs data from the kernel cache that no longer reflects reality. For the purposes of files that a given process is accessing, though, I haven't had any issues to complain about.

Temporary Stop

We covered a lot of ground this month. All of this is to get you a little more intimate, intertwined, and aware of the system that is OS X. Many times, troubleshooting and learning about OS X comes down to figuring out where a file is or what files have changed within a certain

period of time. Next month, we'll carry on using this column as a foundation.

Media of the month: Go rent (or take off your shelf – you know who you are) *Tron*. Seriously. Incredibly far ahead of its time. If you watch it after having read this column, it should connect a few more synapses.

Until next month, dig in, experiment and enjoy!

References

Mac OS X Tech O: Core OS

http://developer.apple.com/documentation/MacOSX/Conceptual/OSX_Technology_Overview/SystemTechnology/chapter_4_section_2.html#//apple_ref/doc/uid/TP40001067-CH207-TPXREF101

Kernel Programming Guide:

<http://developer.apple.com/documentation/Darwin/Conceptual/KernelProgramming/index.html>

MI



About The Author

Ed Marczak owns and operates Radiotope, a consultancy that assists companies with technology planning, and implementation. He helps guide business leaders around the pitfalls of technology, and to find ways of connecting them with their clients. Guidance at <<http://www.radiotope.com>>.

Bluetooth Rechargeable

Bluetooth Mice

- Smooth 800 dpi optical tracking
- No drivers needed for Mac or PC
- RadMouse configuration driver for Mac
- Charges via USB port - cable included

10% off your order with Promo Code MT56Q

www.radtech.com

Entourage 2004 Spotlight Support



An IT Perspective: How Microsoft Entourage 2004 now takes advantage of Spotlight

By Brian Johnson and Andy Ruff

Introduction

In update 11.2.3, Microsoft added support for Spotlight and Sync Services to Microsoft Entourage 2004 running on Mac OS X 10.4. These two features allow users to search Entourage e-mail stores and to synchronize Entourage data with any software or hardware that takes advantage of sync services in the OS.

It's important for system administrators who need to plan deployment of this technology on Macs, and may need to consider configurations with many users, and with limited disk space, to understand how this all works. In this article, we'll focus on the Spotlight support added to Entourage. We'll tell you about how Spotlight support works in this update. Specifically, we'll also address Spotlight support considerations for multi-identity installations of Entourage.

An Overview of Spotlight in Entourage

From the user perspective, Spotlight search in Entourage provides a mechanism that allows for the full text search of items in the Entourage database. Spotlight uses file based metadata and a constantly updating index to return results to queries passed through the Spotlight search interface in the operating system. Results return quickly because the index is updated based on messages coming from the file system. Once the initial indexing is complete on a set of data, additional data is indexed automatically as files update on the system.

One of the difficulties in making Spotlight work with Entourage had to do with how Entourage stores its data. All Entourage data is stored within a single database file per user identity. Entourage was designed to be multi-user at the application level. This was to allow multiple family members to have their own identities in the application in the home environment. Entourage stores its data in a single database for each user identity created in Entourage. When a user first sets up Entourage the Identity they get is named "Main Identity".

In order to support Spotlight searching, we had to develop a mechanism for providing Entourage's database content to Spotlight's file-oriented indexing process. We settled upon a solution that "mirrors" the essential item content and metadata to a series of cache files. As a new message arrives, we store the message within our database and spawn a cache file representing the message. When a user modifies a contact's phone number or changes the dates on an event, we update our database and the contents of each item's cache file. When Spotlight indexes Entourage, it is actually indexing the contents of each cache file rather than the Entourage database. This approach allows Spotlight's indexing process to work its magic on file change notifications, while not requiring a large overhaul of Entourage's data access architecture.

As an Entourage user's database potentially holds years of e-mail messages, the creation of cache files chances consuming large amounts of disk space for essentially redundant data. When we were considering this design, we found that through optimizations such as

writing only plain text content rather than HTML and ignoring e-mail attachments, we were able to generate a cache roughly 20% of the original Entourage database's size. We also decided that the feature would be optional, allowing any user to simply disable the creation of the cache within their Entourage preferences.



Figure 1 – Spotlight is enabled by default for the first identity opened after update 11.2.3 is installed.

The Spotlight preference pane in Entourage allows the user to both toggle the feature and rebuild the contents of the cache. On a moderately sized database of 200 MB, the creation of the cache file takes only a few minutes and happens in the background. The Rebuild button simply deletes all existing cache files, crawls the Entourage database, and generates a set of new cache files. A user would only need to rebuild if problems arise, as Entourage will continue to create, update, and delete cache files with each action performed on the Entourage database.

Once the cache files are created, Entourage's role in the indexing process is complete. Spotlight chooses when to index the cache files and how the results are displayed in the Spotlight Search Window, Smart Folders, and the Finder's Find functionality. As indexing progresses, the index in Spotlight is updated and queries containing the information the user is searching for begins to show up in the Search window. If you search for a set of words and Spotlight indexes an Entourage mail message with a matching phrase, the message will suddenly appear within the Spotlight Search Results Window. Figure 2 shows the results of a typical Spotlight search with Spotlight enabled in Entourage. The returned Entourage items can include mail, appointment, contact, task, and notes data.

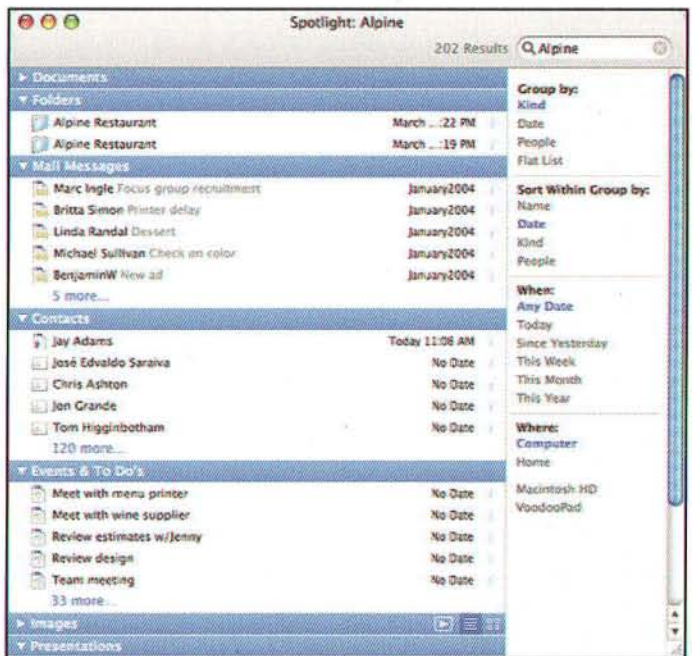


Figure 2: Spotlight search results with Entourage items returned.

Double clicking on a returned item in Spotlight works as expected. You see the Entourage item open, just as if you had clicked on it in Entourage. So what's going on under the covers? Let's use some command line tools and take a look.

Query with Command Line Tools

There are a number of command line utilities that we can use to query the Spotlight database. We can use these tools to see where Entourage is storing the Spotlight metadata that it's creating and we can also see what the metadata files themselves look like.

The first tool to look at is `mdfind`. `mdfind` queries the metadata store and returns the results of our query. This tool takes three parameters. The `-live` parameter will continuously scan the database for results and you'll see items added as they come into Entourage. The `-onlyin` parameter allows us to specify a particular folder for the search. Finally, the query parameter, a string representing the information that we're searching for. Apple's developer documentation provides more details on the syntax of Spotlight queries. Let's see if we can use this tool to find an Entourage item and see where the metadata is being stored:

Running the command "`mdfind welcomee@microsoft.com`" on my machine returns a result with the path:


```
/Users/Brianjo/Library/Caches/Metadata/Microsoft/Entourage/2004/Main Identity/Messages/OT/0B/0M/0K/1.vRgeMessage
```

The .vRgeMessage file is an Entourage mail message's cache file. When you perform a Spotlight search, the results always return cache files. As mentioned previously, cache files are merely file-based mirrors of Entourage database records with the metadata and content necessary for Spotlight indexing. The name of the cache file is the record ID for the corresponding database record. When a user opens the cache file from a Spotlight result, Entourage reads the filename, looks up the record ID within the database, and shows the item directly from the database.

The mdls command line utility allows you to see the metadata Spotlight has indexed for any given file. By passing the path to the 1.vRgeMessage cache file from our mdfind result to mdls, we can see Spotlight knows the following about the e-mail message:

```
/Users/Brianjo/Library/Caches/Metadata/Microsoft/Entourage/2004/Main Identity/Messages/OT/0B/0M/0K/1.vRgeMessage ———
```

```
com_microsoft_entourage_folderID      = 1
com_microsoft_entourage_messageSent   = 2006-03-21 00:23:21 -
0800
com_microsoft_entourage_recordID      = 1
com_microsoft_entourage_size          = 37783
kMDItemAttributeChangeDate            = 2006-03-21 21:55:25 -
0800
```

```
kMDItemAuthors                        = ("The Microsoft Mac
Team <WelcomeE@microsoft.com>")
kMDItemContentCreationDate            = 2006-03-21 00:23:21 -
0800
kMDItemContentModificationDate        = 2006-03-21 21:55:24 -
0800
kMDItemContentType                    =
"com.microsoft.entourage.virtual.message"
kMDItemContentTypeTree                 = (
"com.microsoft.entourage.virtual.message",
"public.message",
"public.data",
"public.item"
)
kMDItemCoverage                       = "Inbox"
kMDItemDisplayName                    = "Welcome to Microsoft
Entourage 2004 for Macintosh"
kMDItemFSCContentChangeDate           = 2006-03-21 21:55:24 -
0800
kMDItemFSCreationDate                 = 2006-03-21 21:55:24 -
0800
kMDItemFSCreatorCode                  = 0
kMDItemFSFinderFlags                  = 0
kMDItemFSInvisible                    = 0
kMDItemFSIsExtensionHidden            = 0
kMDItemFSLabel                        = 0
kMDItemFSName                         = "1.vRgeMessage"
kMDItemFSNodeCount                   = 0
kMDItemFSOwnerGroupID                 = 501
kMDItemFSOwnerUserID                  = 501
kMDItemFSSize                         = 6584
kMDItemFSTypeCode                     = 0
kMDItemID                             = 4306567
kMDItemKind                           = "Microsoft Entourage
message pointer"
kMDItemLastUsedDate                   = 2006-03-21 00:23:21 -
0800
kMDItemRecipients                     = ("New Microsoft
Entourage User ")
kMDItemTitle                          = "Welcome to Microsoft
Entourage 2004 for Macintosh"
```

Big Security

for the small business



CRYPTO-Server 6.3 is the Mac-centric authentication solution for IT infrastructures organized around Mac OS X. Once implemented, your Mac becomes the centralized authentication and token management system for all users, regardless of their computing platform or location.

For Mac Desktops

- Enforced **CRYPTOCARD** authentication for desktop access – *Startup, Screen Lock, Sleep*
- Authenticated Fast User Switching
- Internet Connect MSCHAPv2 (Tiger)
- Cisco VPN Client for Mac Integration

Infrastructure Integration

- Open LDAP integration
- Open Directory integration
- Databases (MySQL, Oracle)

Network Integration

- RADIUS-enabled systems – *VPN, Firewall, NAS*
- Web Servers & On-Demand Computing – *Apache, IIS, Citrix*

MacWorld “**Best of Show**” Winner,
CRYPTOCARD introduces **5-User Kit for OS X**, the “All-In-One-Box” Authentication Solution that lets your security grow with you.

MACTECH SPECIAL OFFER

5-User Kit for only **\$249**

* includes 5 tokens, CRYPTO-Server software & 30-day support.

Email mac@cryptocard.com and quote **SPMac249-01**.

Promotion can end without notice.

CRYPTOCARD
Secure Password®
TECHNOLOGY
www.cryptocard.com

no more auction management headaches.



INDICATIONS: For rapid relief from monthly fees, disorganization, and lost sales. Aids in listing, inventory management, email marketing, trends analysis, customer retention management, and other activities associated with selling profitably on eBay.

DOSAGE: One installation. Subsequent updates are automatic.

DIRECTIONS: List. Sell. Repeat.

ACTIVE INGREDIENTS: automation. scheduled events. custom actions. offline capability. import from turbolister, excel, and databases. ledger. groups. cash flow analysis. support for eBay stores and eBay motors. custom reporting. html editor. bulk listing, ending, revision. relisting. free scheduled listing. offline listing preview. ad templates. image management. watermarks. spell check. consignment management. profiles. vendor management. auto reorder. product sales analysis. questions and feedback management. spam control. fraud management. email templates. invoicing. dispute management. email marketing campaigns.

WARNING: Side effects may include increased sales, higher efficiency, and euphoria.



please visit www.marketblast.com for a free sample.

Whenever possible, metadata provided by Entourage is designed so that attribute names and values match those used by an analogous Apple application (e.g. message title). We hope that this will allow anyone who builds a solution on top of Spotlight may easily support Entourage alongside Apple's applications. We only deviated by adding additional attributes – nearly all properties available in our AppleScript dictionary are available as metadata. The design is intended so that scripters can use Spotlight as a quick way to query information and round-trip interactions with results through AppleScript. It also makes it possible to create useful queries such as “all unread messages today” (`com_microsoft_entourage_unread == 1 && kMDItemContentCreationDate >= $time.today`).

Importing Metadata

Spotlight is designed such that it does not need to know about the file format of each file in order to index the file's contents. Instead, a developer provides a plug-in for Spotlight that handles both reading a file and returning metadata to the Spotlight indexing engine. These plugins are known as Metadata Importers and may be found in `\Library\Spotlight` or are sometimes located within an application's bundle.



Figure 3: The Microsoft Entourage.mdimp importer plug-in

The metadata importer plug-in that's used with Entourage is called `Microsoft Entourage.mdimp`. When Spotlight comes across an Entourage-generated cache file, Spotlight passes the path of the file to the Entourage metadata importer, the importer reads the file, and then passes the metadata back to Spotlight. You can see the info for this plug-in in Figure 3. Notice that this plug-in is a universal binary and that it runs natively on an Intel-based Mac.

Multiple Identities?

There are a few things that system administrators should understand if they are

going to use Spotlight search in multi-user scenarios. Given that Entourage can work as a multi-identity application, one thing you'll probably wonder about is, how does Spotlight know about the currently active identity in Entourage? The answer is that it doesn't. While we only automatically enable Spotlight indexing for the first identity launched after the update is applied, a user may turn on indexing of additional identities by enabling the Spotlight preference in Entourage. If the user then double clicks on an item, that item is only opened if its associated identity is currently active. Entourage actually uses the folder path to determine the identity of a result. If the identity is not currently active then the user will get the message shown in Figure 4.

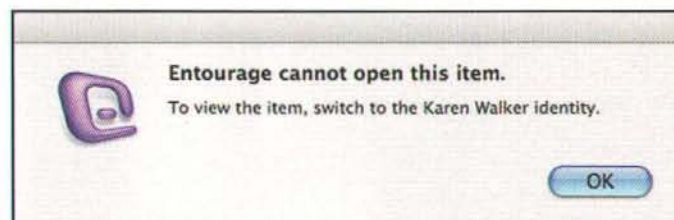


Figure 4. Trying to open an item associated with an inactive identity

As you can imagine, in scenarios where many people use the same account on a Mac and then differentiate identities in Entourage, Spotlight could become pretty useless when trying to find specific e-mail items as search results intermix results across multiple identities. For that reason, Microsoft recommends that in situations where multiple users will want to use Spotlight search with Entourage, users should have their own user accounts set up on the Macs.

Removing Spotlight from Entourage

There are a number of reasons a system administrator might want to completely disable Spotlight searching in Entourage. First, multiple user accounts on a machine are not always practical. In some cases, schoolrooms use a single account per classroom and kids are able to check their e-mail by simply switching identities in Entourage. On a machine with many dozens of identities, using Spotlight to find anything could be pretty difficult. Second, the cache used for Entourage content does take disk space. In a scenario where a user has a large entourage database, or there are multiple accounts on the machine with large databases, disk space can potentially become an issue. Finally there are privacy considerations around using Spotlight searches on Entourage content, especially if multiple identities are used on the same user account. Even if the searcher can't see the e-mail that's returned, they might be able to get more information than the user wants them to have about items returned in a search.

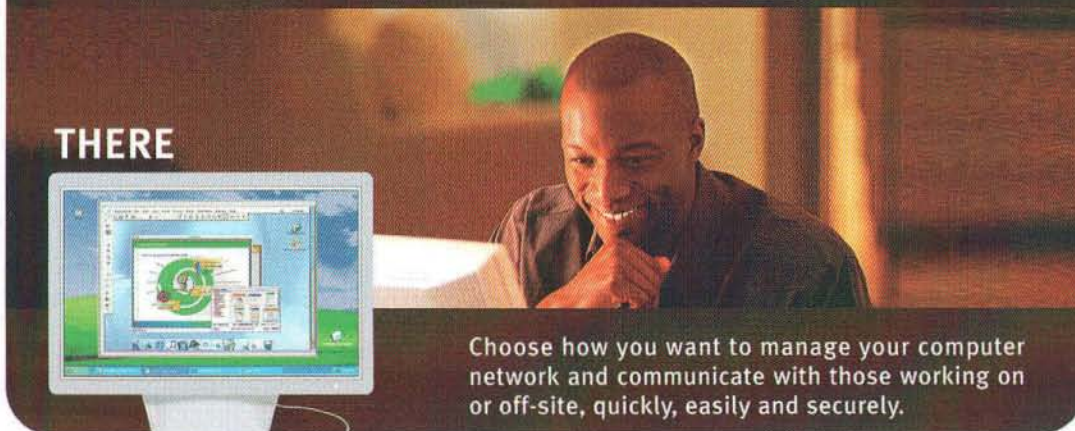
To completely disable Spotlight in Entourage, simply remove the `Microsoft Entourage.mdimp` plug-in

Stay In Control Wherever You Go.



Netopia's products have been the leading remote control and web-based remote access solutions for the distributed enterprise.

On Mac OS



Choose how you want to manage your computer network and communicate with those working on or off-site, quickly, easily and securely.

or Windows

Timbuktu® Pro

Whether you're at home or at work, using a Mac OS or Windows platform, Timbuktu Pro allows you to operate distant computers as if you were sitting in front of them. Transfer files and folders quickly and easily, and communicate by instant message, text chat, or voice intercom.

eCare

eCare's web-based remote access capabilities enable any user to securely place their virtual eyes and fingers directly on the remote client's desktop for collaboration, problem resolution, and improved customer satisfaction. Using only a web browser, eCare's secure and fast screen sharing, file transfer, live chat, URL push and live session recording make it the ideal solution for the conference room, classroom, or help desk – live, on demand.

Download an evaluation or buy it online: www.netopia.com

Call us at 1-800-485-5741

© 2005, Netopia, Inc. All rights reserved. Netopia, the Netopia design, and Timbuktu are registered trademarks belonging to Netopia, Inc., registered in the U.S. Patent and Trademark Office. All other trademarks are the property of their respective owners.



timbuktu® pro • eCare

netopia®

from the /Library/Spotlight folder and restart Entourage. When you look at the Entourage preferences you'll see as in Figure 5, that the Spotlight preference is no longer available.

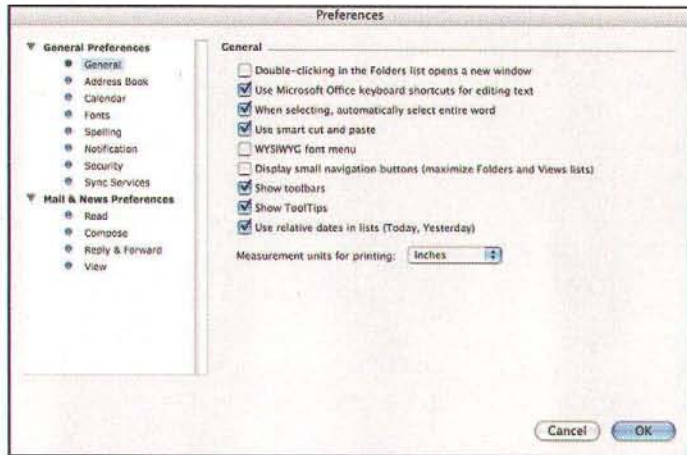


Figure 5: Spotlight removed from Entourage preferences

Finally, if you completely disable Spotlight in entourage, remember to go to the /Users/<username>/Library/Caches/Metadata/Microsoft/Entourage/2004/ folder and delete any folders there that you no longer want to be available in Spotlight searches.

Conclusion

In this article, we've described how Spotlight works with Entourage 2004. The Spotlight search functionality added in update 11.2.3 fundamentally changes the way that you can work with e-mail, contacts, calendar items, and notes in Entourage, allowing you to instantly find data you need using the tools built right into Tiger. This update makes Entourage a true, first class citizen in the OS and it makes working with Entourage data on the Mac easier than ever.

Bibliography and References

- Apple Computer. "Working with Spotlight".
<http://developer.apple.com/macosx/spotlight.html>.
 M. Amir Haque. "Spotlight Support in Entourage 2004". *The Entourage Blog*,
<http://blogs.msdn.com/entourage/archive/2006/03/17/553801.aspx>

MI

About The Author

Brian Johnson is the Microsoft Entourage Product Manager. You can contact Brian by e-mail at brianjo@microsoft.com, or you can read his blog at <http://bufferoverrun.net>.

Andy Ruff is an Entourage Program Manager, and is the author of *The Entourage Blog* (<http://blogs.msdn.com/Entourage>).

iAutomate.



Edit, optimize and convert all your images and video for optimal display on Web, Office apps, 3G phones, iPod and portable media players with a simple drag and drop.



Save Time and \$50 on Equilibrium® DeBabelizer® Pro for Mac® OS X/Windows® XP when you order now.*

*For a limited time only, get a \$50 mail-in rebate when you order from your favorite software outlet. Go to www.equilibrium.com for details and call us at 866.EQUILIB (+1.415.332.4343) with any questions.

MacMall

ClubMac



programmer's paradise

Fry's Outpost.com

J&R

shi



equilibrium®
Serving the Media Generation.

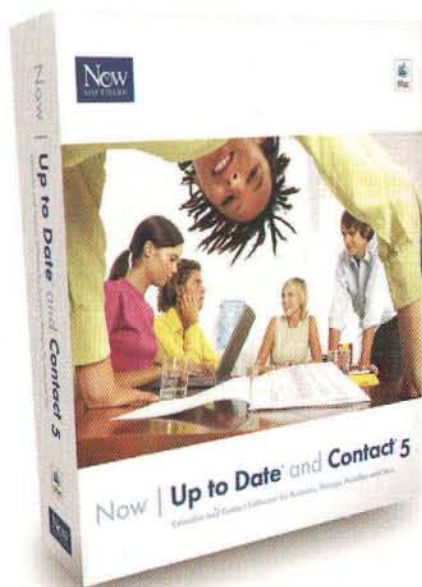


Now scheduling
and contact
management
for your entire
organization.



Now | Up to Date® and Contact® 5

Calendar and Contact Software for Business, Groups, Families and You.



Is this project on schedule? When are you available to meet about the systems upgrade? Where are all the field techs today? When was the last time anyone talked to our biggest customer?

Virtually all groups live (or die) by their abilities to meet deadlines and keep track of their customers, prospects, and vendors. Few small companies or even departments of big companies have the tools they need.

Now Up-to-Date & Contact might just be the calendar and contact software for you. It's time-tested and used by more Mac-based companies than any other solution. And it's cross-platform—available for your PC users, too. It's easy to install and manage and simple for your employees to understand and use.

Using Now Up-to-Date & Contact you can schedule meetings for multiple users, view multiple, simultaneous calendars, and reserve rooms and resources. You can share contact information about your customers, prospects and vendors. And using our free server software you can set it up in minutes and share with users in the office or from anywhere with an internet connection.



Phone: 866-527-0556

Web: www.nowsoftware.com

Call us now at 866-527-0556 or email us at mactech@nowsoftware.com and we'll send you our free evaluation kit, including the book that will make it all easy, "Take Control of Now Up-to-Date & Contact" from Take Control books!

Office 2004 Benchmarks on Intel-based Macs



By the MacTech Editorial Staff

The Big Question

If you are a Microsoft Office user on the Mac, there's likely a question on your mind if you are considering purchasing a new Mac based on the Intel processor. You see, currently, Microsoft Office is not "Universal." In other words, it runs on top of Rosetta (Apple's technology to dynamically translate PowerPC-based applications to work on Intel-based Macs). Now, Microsoft has announced that the next version of Office *will* be Universal, but no one expects this imminently. (It's a big job, Apple released their Intel-based machines earlier than expected, and Office isn't borne from Xcode.)

The big question is this: Does Microsoft Office 2004 run well enough on the new Intel-based Macs? Or should you delay your purchase of these machines?

The Test Bench

We chose three machines to compare. Our baseline machine is a PowerBook G4 15-inch, running a 1.5 GHz PowerPC G4, with 2 GB RAM, and an 80 GB/5400 rpm hard disk.

We compared a MacBook Pro 15-inch, running a 1.83 GHz Intel Core Duo, with 2 GB RAM, and a 120GB/5400 rpm hard disk.

And finally, we compared an iMac 20-inch, running a 2.0 GHz Intel Core Duo, 1.5 GB RAM, and a 250GB 7200-rpm Serial ATA hard disk.

For those interested in the benchmarking methodologies, see the more detailed testing information in Appendix A. For the detailed results of the tests used for the analysis, measured in seconds, see Appendix B. Both appendices are available on the MacTech web site.

Overview

We won't keep you in suspense. In general, Office 2004 under Rosetta works "well enough" to "very well," and in some cases, *it's even faster* than on the PowerPC machine.

In general, Office 2004 under Rosetta works "well enough" to "very well," and in some cases, it's even faster than on the PowerPC machine.

To determine this, MacTech ran over a thousand tests across three models of Macs, and the four major Office applications: Word, Excel, PowerPoint and Entourage. And, since graphics code is shared between Office applications, we ran a suite of graphics tests as well. These are each covered in more detail below.

In one of the most critical set of tests, we specifically looked at whether the user could type or interact faster than Office could keep up, and even in the slowest of scenarios, we

never found the user waiting for typing, or other interactions like selecting menus. Even when typing at over 100 wpm, Word was able to stay ahead of the user.

Of the four applications, PowerPoint, is the one that struggled the most. It appears this is due to Office graphics engine shared by all of the Office applications.

At the other end of the spectrum, Entourage was not only on par, it was *faster* in many

cases than our PowerPC baseline. In fact, with the exception of launching the application, Entourage was faster across the board on the Intel iMac, while the MacBook Pro was about on par with the PowerBook G4 (slightly faster in some cases, slightly slower in others).

What was interesting is that even on those tests that were slow, they were still acceptable. For example, the test with the worst performance was inserting a large JPG (over 10mb) into a document was considerably slower. In most cases, a 10 megabyte JPEG would be larger than an 8.5x11 page. How often do users insert large JPEGs in a single sitting? And, when they do, does it matter when that something takes 10 seconds more? Not in our opinion ... and we use Word a *lot* at MacTech.

It appeared to us that the more modern the application, the better it did under Rosetta. Furthermore, the more that something used the underlying Mac OS, the better it did as well. For example, Entourage did very well with networking related

A young boy with light-colored hair, wearing a grey long-sleeved shirt and light-colored pants, stands in a field of tall grass. He is looking up at a dark blue night sky filled with stars. In the background, a single tree stands on a distant hill under a soft, glowing light on the horizon.

Remember when the sky was the limit?

Get ready for a new way of thinking.



INTEL® SOFTWARE DEVELOPMENT PRODUCTS FOR MAC OS*

Intel's commitment to Apple isn't just about hardware. It's also about offering development tools that use the power of the processor to take your applications to the next level. With support for Apple development environments and languages such as Xcode* and Apple Frameworks, our products work with the tools you're already using today. So whether you build applications for physics or financial analysis, Intel® Software Development Products give you the tools you need to transform power into performance.

Download a trial version today.
www.intel.com/software/products/nolimits

items. Raw imports and opening did significantly better especially when a faster disk was involved.

And, the more times you did a function, the better it performed especially on the second iteration of a command. While it's difficult to confirm, this is due to a combination of code working smarter with caches, both in Rosetta as well as within the Office code base. An obvious benefit for those tasks that are most sensitive to time: the repetitive ones.

The Test Suite and Results

The tests used were selected specifically to give a real-world view of what Microsoft Office 2004 is like to run. We eliminated those tests that we ran that were so short a time frame (e.g., fast) that we could not create statistically significant results, or that had imperceptible differences.

We did one test suite for each of the four major applications in Office, as well as a series of tests focused on the graphics libraries. As you may or may not know, Office 2004 uses a common set of graphics libraries across the applications in Office. With that in mind, we considered a set of tests that would test these technologies, and they are a good representation across all the applications in Office. For example, when you import a graphic, it should be the same across the Office suite.

To give users a good idea of what it's like to use each of these apps, we came up with a list of tests that represented what we felt were the most relevant to regular use. For example, we ran tests on application launches, but did not focus on them since it's something that people tend to do only a couple of times a day. But, we did include the most repetitive of tasks within an application, as those affect productivity most.

The one thing that we did see across the board is that the Intel iMac is consistently faster than the MacBook Pro. Since the iMac had slightly less RAM, and the processor and front side bus speeds are the same, we looked further inside. The iMac has some pretty serious sub-systems design to make it a screaming machine (see <<http://developer.apple.com/documentation/HardwareDrivers/Con>

ceptual/iMac_06Jan/>. When you take into account that an iMac has SATA (instead of ATA), a faster hard drive (a 7200 vs. the MacBook Pro's 5400 rpm), and a variety of optimized sub-systems that would be more difficult to implement on a laptop, it's easy to see why the iMac is faster.

It's important to realize that many of the actions that users do when using these applications are so fast already, that even a degradation of 50% may not even be noticeable for most tasks. And in the non-repetitive tasks, they are nearly irrelevant. For example, if when launching an application, you have to wait several seconds, many users will notice, but it won't matter to their overall productivity.

Other areas, like repetitive tasks or editing actions, are far more important, and speed makes a great deal more difference in not only perception, but in productivity.

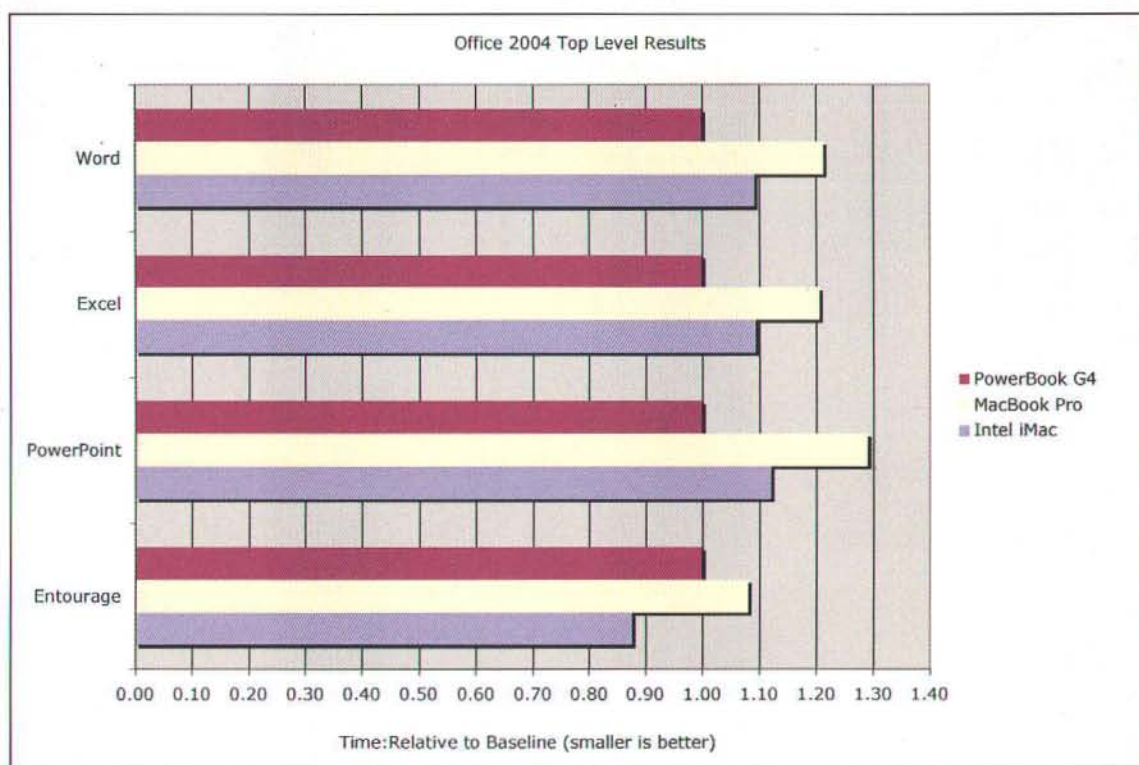


Figure 1: Office 2004, Average User Tests

An overview of tests that best represents productivity is displayed in Figure 1. These metrics include a variety of tests normalized to give you an overview. Smaller bars are faster (better). Information on what is included in each of these overview metrics, as well as additional testing information and graphics are shown later for each application.

Word

Of all the applications, Word is probably the most widely used by people. The most relevant tests to most Word users are those that are repeated throughout the use of Word. For productivity tests, we selected a variety of scrolling tests, saving, word count, find & replace, opening files, pasting and printing.

Subject: HELP!

IT DEPARTMENT

From: Joe Arnold (Graphics Department)
Sent: Today at 10:45 AM
To: IT Department
Subject: HELP!

We need you to find a solution that is going to:

- Let our Graphics and Prepress people find their files quickly
- Simplify our archiving process
- and INTEGRATE with our FileMaker Pro Database

... by tomorrow.

JOE -
check out ...
www.meta-comm.com



New Version **Digital Storage Manager™ 1.5** Intranet Search and Archive Management for Creative Workgroups

Digital Storage Manager is the first intranet search and archive management system for creative and prepress workgroups. Digital Storage Manager offers:

- Ability to search and instantly find files by production related metadata.
- A simple one-step Archiving solution including integration with: CA Software ARCserve, Rimage, EMC Dantz Retrospect, Mac OS X File Burner, Roxio Toast, Microsoft Removable Storage Manager.
- Secure Web Portal provides your customers, freelancers or other departments the ability to search and download files via the web.
- Integrates with existing job or production management systems, including FileMaker Pro.

Meta
COMMUNICATIONS

Download a 21 Day Trial or Call to Schedule a Demo
Web: www.meta-comm.com Tel: 1-800-771-6382 Email: sales@meta-comm.com

Meta Communications, Inc. is a trademark of MetaCommunications, Inc. All rights reserved. Additional company and product names may be trademarks or registered trademarks of the individual companies.

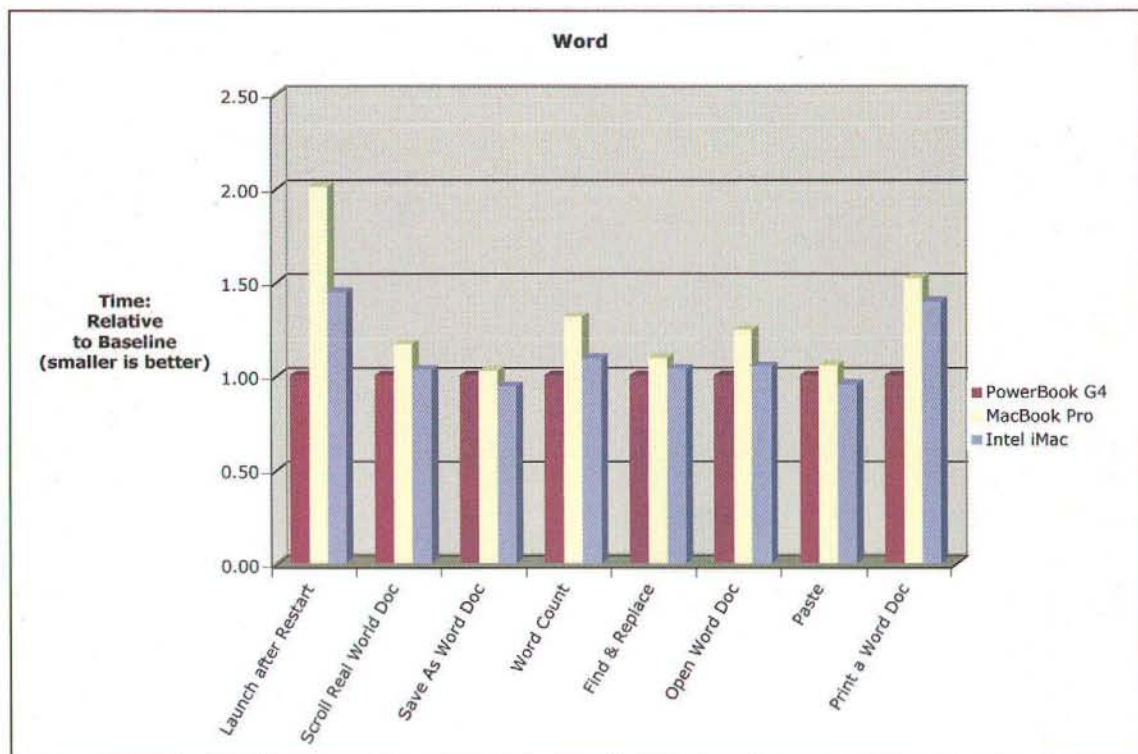


Figure 2. Word Benchmark Results

The end result is that, for productivity tasks, Word on MacBook Pro performed at 82% of the speed of a PowerBook G4, and on an Intel iMac at 92%. In a real life scenario, these numbers put Word at working pretty well. There's not much a perceptual difference for most tasks.

Our top level grouping included a application launching, variety of scrolling tests, saving, word counts, find & replace, opening documents, pasting and printing. The results are in Figure 2.

But, of course, the most important of the tests – typing – were so fast that we couldn't measure them. No matter

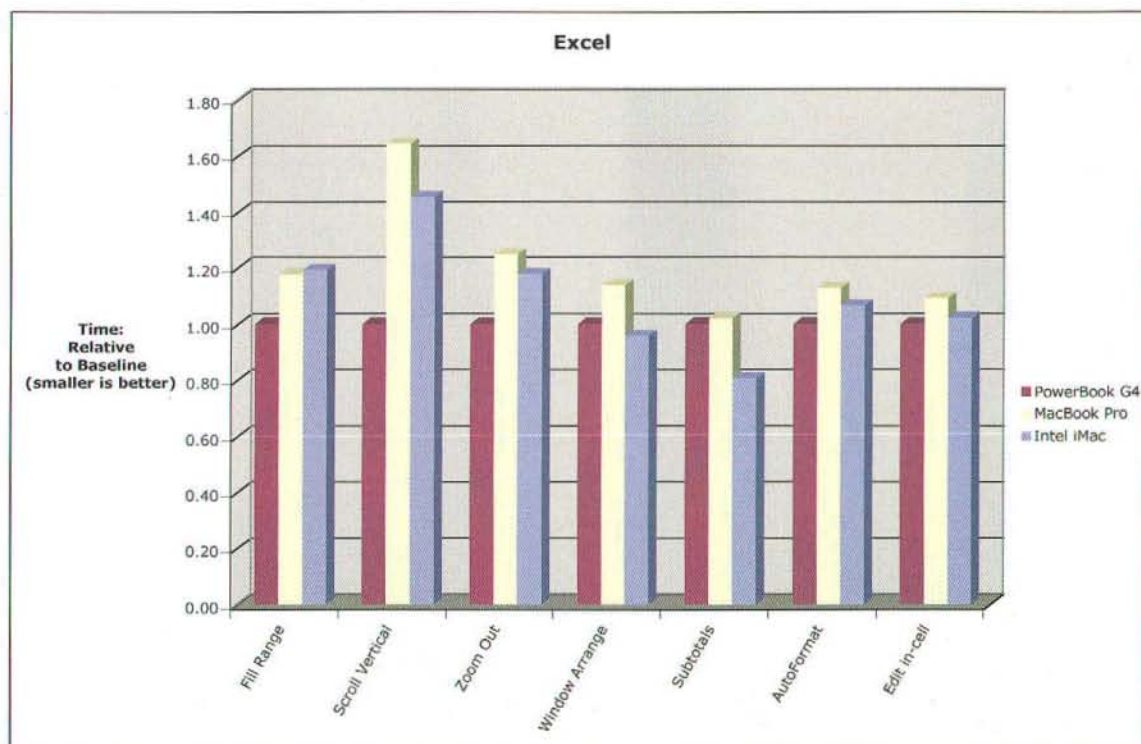


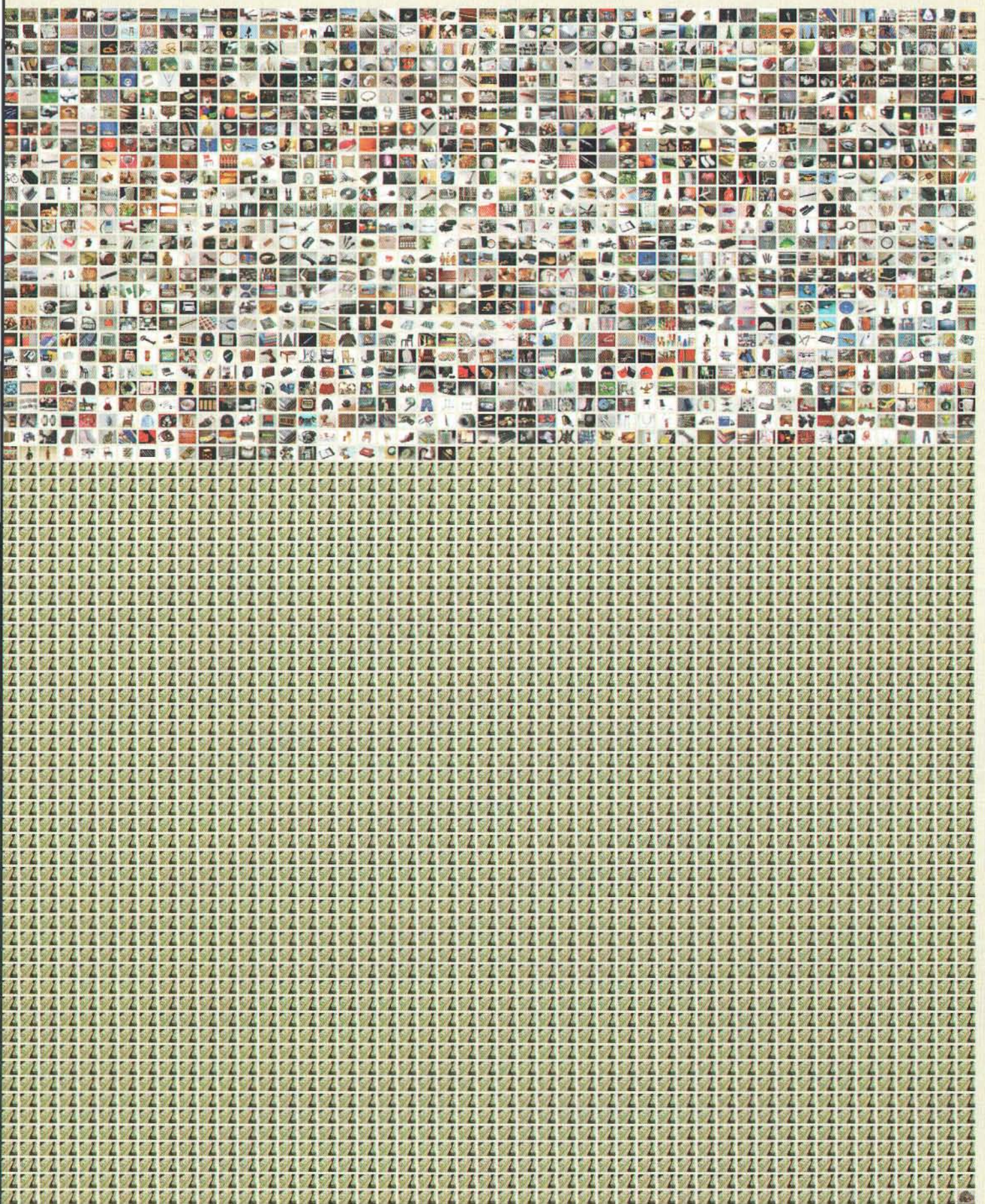
Figure 3. Excel Benchmark Results

WHAT SHE GOT IN THE DIVORCE

COMPRESSED BY

STUFFIT DELUXE

SOFTWARE FOR MAC/PC



what the computer model, Word was ahead of the typist (even at 100 wpm).

The areas that Word performed "well enough" in are the initial launch of the application launching and printing. Fortunately, these are things that most users do relatively infrequently and don't materially affect productivity.

The balance of the tests ran on par, or in some cases *faster* on the Intel iMac. As is consistent throughout, the Intel iMac was faster than the MacBook Pro, and in some cases (most notably saving and pasting), the iMac was faster than the PowerBook baseline.

Our one and only crash during the entire Office testing set was during a find and replace in Word. A quick re-launch, and everything proceeded as expected.

The end result is that while there are a couple of areas that a user may notice it's slower, Word works well on a MacBook Pro; and, on the Intel iMac, it works very well, under Rosetta.

Excel

For Excel, we wanted to focus again on the most repetitive tasks. For productivity tests, we selected fill range, scrolling vertically, zooming out, arranging windows, subtotals, auto-formatting, and editing in-cell. On average for the productivity tests, Excel performed at 83% of baseline for the MacBook Pro, and 91% for the Intel iMac.

Most users use relatively small spreadsheets, but it's important to take a look at what a more experienced spreadsheeter may experience. As a general rule, editing and calculations were very fast and in some cases, faster than on the baseline PowerPC.

For our top level testing, we looked at the common commands including fill range, vertical scroll, zoom out, arranging windows, subtotals, auto-format, and editing in-cell. The results are displayed in Figure 3.

Scrolling did leave a bit to be desired, but it definitely worked well enough, even on the slower MacBook Pro. In our tests, we used a very large Excel document, and even so, the test ranges were 6.18 to 10.15 seconds. Certainly enough to perceive, but given the very large size of the

test document, under normal circumstances, it's not enough to affect productivity.

The end result is that for Excel on a MacBook Pro, it works very well, and on the Intel iMac, even better. Users may notice slower scrolling, but that's about it as far as the most common tasks.

PowerPoint

For PowerPoint, we chose a variety of tests to represent productivity including opening, saving, scrolling slides in the sorter view, adding slides, viewing slide shows, slide transitions, text animations, printing, inserting images from the ClipArt Gallery, changing color schemes and applying templates. As we already mentioned, PowerPoint was the slowest of the Office suite, but in our most indicative tests for productivity, it did perform at 77% of the speed for the MacBook Pro, and nearly 90% for the Intel iMac.

In our top level testing, we took a look at launching, opening files, saving, scrolling slides in sorter view, adding slides, viewing slide transitions, viewing text animations, printing, changing color schemes and applying templates. The results are shown in Figure 4.

The areas PowerPoint was weakest were with complex files, printing and applying templates. That said, PowerPoint did pretty well with view slides and transitions, animations, and scrolling in the sorter view.

The bottom line is that even if you use PowerPoint regularly, it definitely works well enough for most people, and in the most important areas ... the presentation itself ... it works very well. If you are a heavy PowerPoint user, you will notice sluggishness, and you should take a closer look.

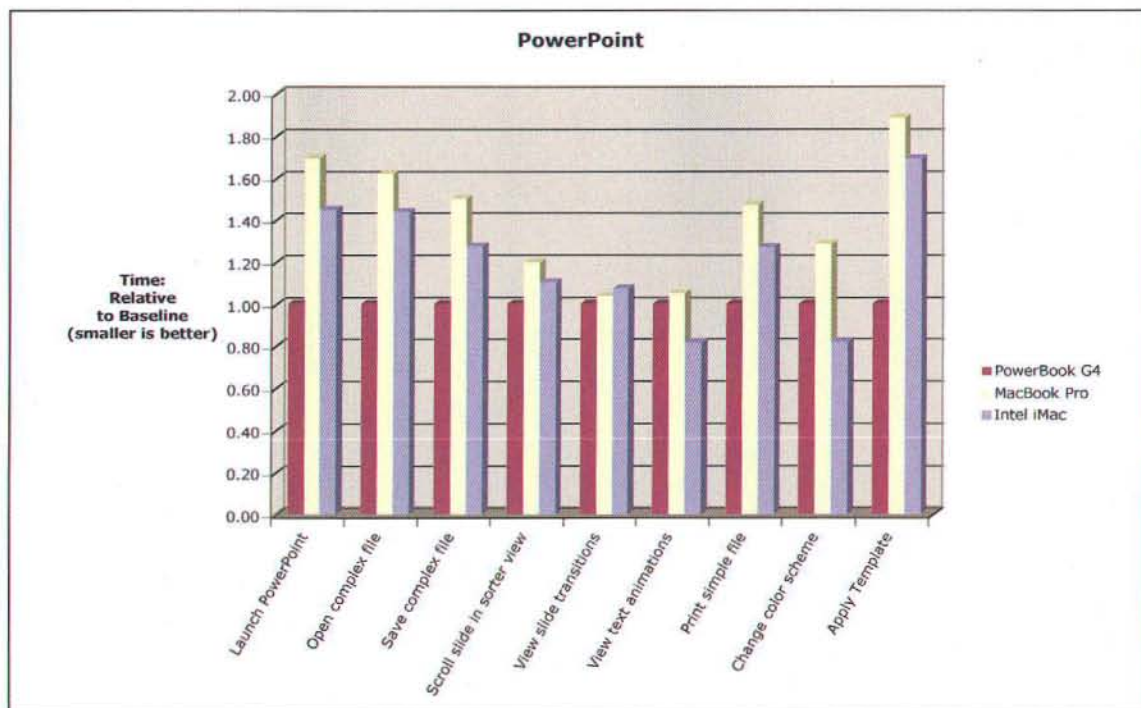
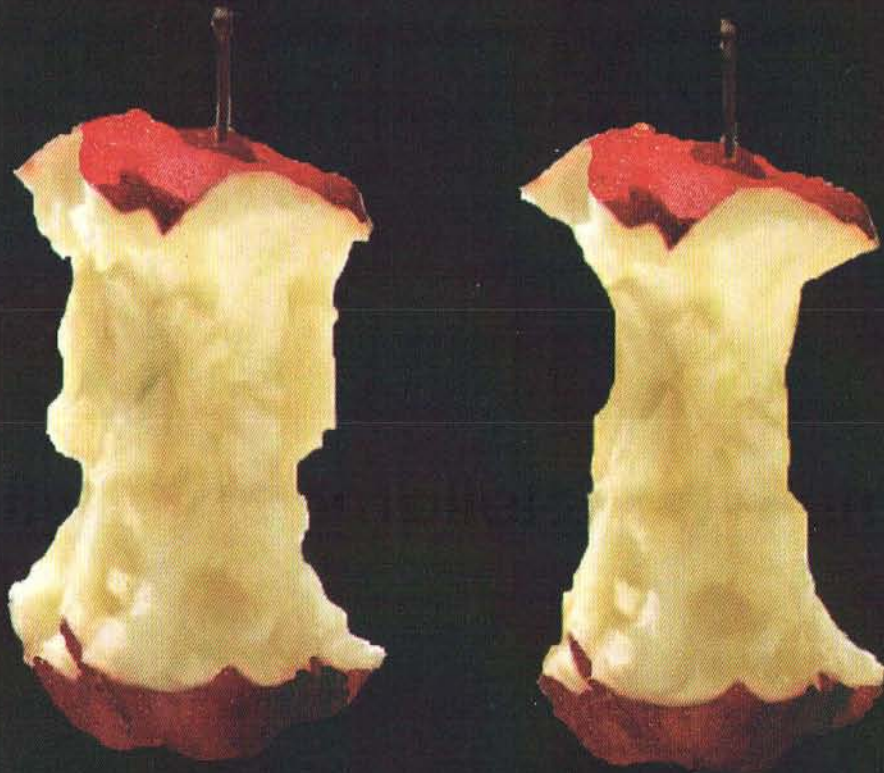


Figure 4. PowerPoint Benchmark Results

Really fast compilers have arrived ...



Get the most juice out of your new apples!

**New compilers, debuggers, libraries, and powerful tools
from Intel® and Absoft are now available
for Apple® computers using Intel® processors.**

**Order today - Contact sales@absoft.com or call 248-853-0050
<http://www.absoft.com>**

absoft®

Development tools for Apple® customers since 1984

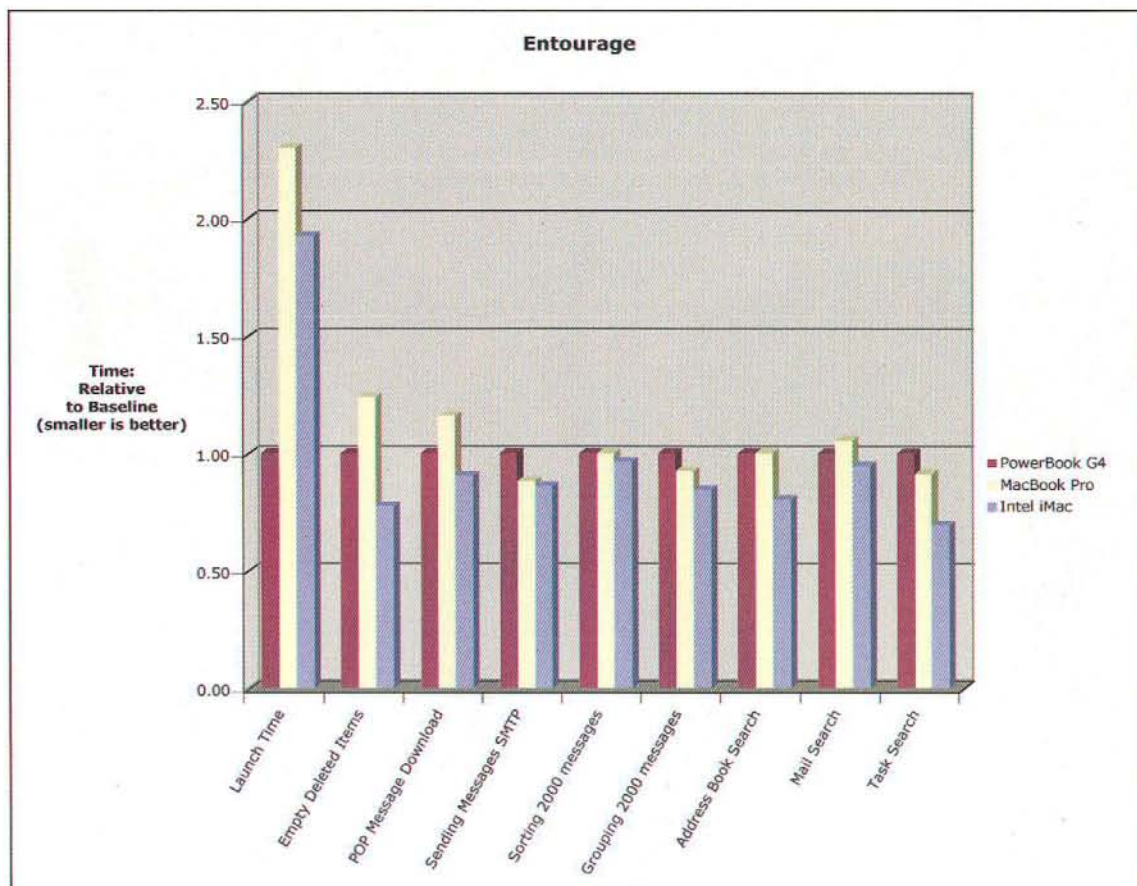


Figure 5. Entourage Benchmark Results

Entourage

For Entourage, the productivity tests included IMAP account sync, empty deleted items, opening messages, pop message download, opening folders, sending messages via SMTP, sorting and grouping 2000 messages, and searching the address book, mail and tasks. For the productivity tests, Entourage shined with the MacBook Pro performing at 92% of the baseline speed, and the Intel iMac performing 14% *faster* than the baseline PowerPC.

In our top level testing, we took a look at launch time, empty deleted items, POP message download, sending SMTP messages, sorting and grouping thousands of messages, and searching the address book, mail and tasks. Results are shown in Figure 5.

Like Word, the most important of the tests, typing, were so fast that we couldn't measure them regardless of which test machine.

Boot time was clearly slower – about double in fact. But in a game of seconds, and for something that you generally only do a couple of times a day, it's not particularly relevant.

Entourage is clearly the best performer in the suite, presumably because Entourage is the most modern code base of the Office 2004 suite, and because it relies the most on Mac OS X technologies that have already been made Universal.

The end result is that, across the board, Entourage under Rosetta performed terrifically. The MacBook Pro usually

performed as good or better than the PowerBook. The Intel iMac was faster in almost every test.

Microsoft Office Graphics

The weakest part of Office under Rosetta is the graphics code shared across Microsoft Office. PowerPoint shows this most given its nature.

In reality, however, this affects the overall Office experience relatively little. Furthermore, for the graphics libraries, our tests were designed to point out weaknesses and give us measurable results. But let's be real: how often do you import a 10-megabyte JPEG? Most JPEG's that size would be much larger than a full page.

That said, we focused on the tests on inserting large graphics, opening, saving, printing, working with the WordArt features, and the ClipArt library.

The end result is that inserting JPEG's are slow, and we saw the impact across all the Office applications. Fortunately, most users don't tend to do this repetitively. Other formats like inserting EPS and PSD files did much better. In other words, you'll have no issues with your logos and template graphics.

Opening graphics files was ok, but fortunately, saving files was significantly faster (a good thing since users typically save

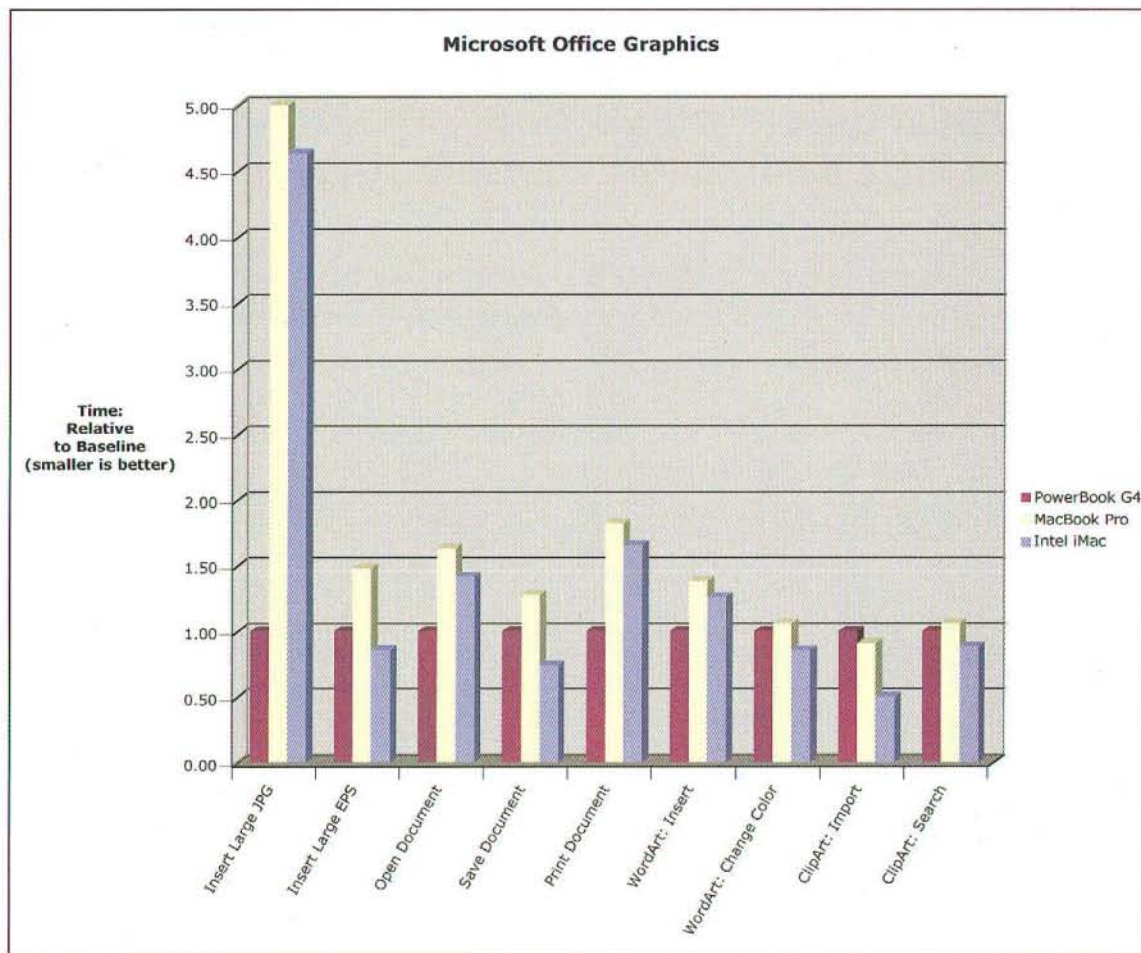


Figure 6. Office Graphics Benchmark Results

much more often than open files). The ClipArt interfaces work very well including the importing and searching.

Conclusion

As we stated at the beginning of this article, in general, Office 2004 under Rosetta works "well enough" to "very well," and in some cases, it's even faster than on the PowerPC baseline machine.

Given the amount we were pushing these apps, we were thoroughly pleased with the stability of the entire Office suite of applications. Considering how complex Rosetta is, and how big a code base Office is, it's entirely remarkable how stable we found it. Furthermore, we expect to see Apple further optimize Rosetta, particularly in launch times.

While Microsoft has already announced that it will be making the next version of Office a "Universal" application, Mac users wishing to dive into Intel-based Macs now can rest assured in knowing they can move forward and be patient for the Universal version.

Mh

HostedStore™

- 1 HostedStore provides a **TURNKEY SOLUTION FOR CREATING A WEB STORE**, yet is extensible so developers can use the application as a base for creating customized solutions for their clients.
- 2 The extensibility of HostedStore provides a structure which allows developers to create modules that add new functionality or alter the built-in features.
- 3 We are seeking software resellers, hosting providers, developers, and designers that currently offer or plan to offer ecommerce solutions to their clients. Resellers receive a discount off of the published list price of our software and are free to bundle our software with their own products and/or services.

www.hostedstore.com



FOUND IN TRANSITION:

WINDOWS AND MAC, SITTING IN A TREE...

When my brand-spanking-new built-to-order MacBook Pro arrived, I immediately went about the task of making it my own. My 12-inch PowerBook G4 1.33 had been my test bed for most of the MacTech articles for the last year and a half, so preparing the MacBook was somewhat like moving into a new apartment or breaking in a new car or pair of shoes, something I would have to live/walk in for the foreseeable future, and because it's such a radical change in processor architecture and software support, it was somewhat like learning how to walk again for the very first time, or drive, or tie my shoes.

The MacBook Pro Arrives

The MacBook isn't that radical of a shift for the typical end-user who'd use it for day-to-day word processing, web browsing, and light graphics work. iLife '06, iWork '06, Safari, and Mail all *scream* running natively on the MacBook's Core Duo 2 ghz processors. An Intel Mac is a different kind of fast. It's difficult to explain, but certain operations just *feel* faster (especially launching applications and booting the Mac), and as unscientific as that sounds, comparing the MacBook to, let's say, a Dual 2ghz PowerPC G5 is like trying to ascertain the difference between two different brands of whiskey. However, for an Open-Source aficionado, it means rebuilding my entire installed base of X Windows and command-line software ports (currently four gigs worth) using Xcode's GCC 4.0 compiler and package managers such as Fink <<http://fink.sourceforge.net>> and Darwinports <<http://darwinports.opendarwin.org>>, and facing the fact that many of the projects I relied on for the PPC processor were now either broken or "back in beta" for the Intel processor. Needless to say, things aren't quite at the level of maturity they'd be if Apple had waited until June to release the Intel MacBooks after having just finished another major transition (Tiger), but

the work on converting those Open-Source super-projects to the Intel platform had already begun in earnest. Many Open-Source projects already compiled and run quite well on the MacBook, while others, including Growl <<http://Growl.info>>, the subject of my last MacTech column, are universal binaries which run on the MacBook as if they never ran on a PowerPC Mac. Those Open-Source goodies *made for Mac OS X* will appear as Universal applications (fat binaries) almost instantly, if not in total by the time this article is printed.



Figure 1. Universal Binary Logo

On the other hand, applications that work directly with HFS+ (a.k.a. the Mac OS Extended file system) or, at the partition-level of hard disks, have even greater challenges to supporting Intel Macs, where there's been a radical change in the hard disk partition scheme. Intel Macs now use the GPT

(GUID Partition Table), instead of the older APM (Apple Partition Map). The reasons for this aren't readily obvious, but it turns out that GPT has a little surprise in store. I wouldn't expect an Intel-savvy version of Alsoft Diskwarrior or Prosoft Drive Genius any time soon, though just about every other type of Cocoa application should be Universal before too long. There's even a roadmap for Universal device drivers (kernel extensions) that would allow the same PCIe card to work in a PowerMac G5 tower as well as the upcoming Intel Pro Mac towers or new Xserves. Nifty!

In 1994, Apple, Motorola and IBM told us that RISC was fundamentally better than CISC, and that all personal computers would eventually adopt RISC, and we believed them. The interesting thing about any transition in processor architecture (the last transition was twelve years ago, in 1994 when Mac users moved from the Motorola 68000 series processors to the PowerPC processors), is that if there's a shift from CISC (complex instruction set computing) and "little endian" to RISC (reduced instruction set computing) and "big endian," then there's going to have to be some form of instruction-level emulation taking place so programs written for the previous processor can still work. For more information on endianness, visit <http://www.noveltheory.com/TechPapers/endianness.asp>. Apple's solution for backward compatibility was to build a PowerPC to 68000 instruction emulator into the ROM on the logic board of each Mac, because even the Mac OS itself wasn't pure PowerPC code, though each iteration of the Classic Mac OS brought it closer to purity. Now, Rosetta ironically performs the same basic function, translating, optimizing, and caching the big-endian instructions of PowerPC applications so they can run on the little-endian Intel Macs. While we all know that "native" code is sexier, faster, and more advanced than "emulated" code, it appears that emulated software and native software are now permanent dance partners orbiting the Maypole of cyclic transitions, from little endian to big endian, and back until all turn into butter.

The idea of running another OS on your primary OS is often called a "guest" OS, which is a polite way of calling it a "parasite" OS and your primary OS the "host" OS. Essentially, the guest OS runs inside its own memory space which looks like any other application to the primary OS, and doesn't necessarily share kernel memory with the main OS (more on that later). If you want your computer to run more than one Operating System, here are ways to do it and the factors that need to be accounted for:

Method 1: Dual Boot

Dual booting is simultaneously the best and the worst way of running another OS on your computer. On the plus side, if you're going to boot into another OS, that means it's not going to require any instruction-level translation, no big endian to little

macforge.netTM

MacForge indexes and tracks open source projects that run on the Mac, or are likely to without modification. Thanks to MacForge, there's no need to sift through huge listings of open source that you can't use. With categories, filters, and more, MacForge makes it easy to find what you need.



MacForge:
Your Gateway to Mac Open Source
www.macforge.net

MACTECH

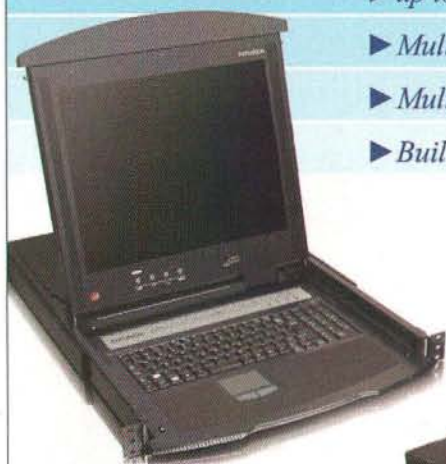
Sponsored by **MACTECH**



The Mac Compatible KVMs

Centralized Local & Remote Management Solutions

- up to 32 Ports
- Multi-platform
- Multi-user
- Built-in Remote IP



ATEN Technology is the innovative KVM manufacturer that offers KVM and remote connectivity solutions for confident management of your IT solutions. ATEN's KVM solutions allow you to manage multiple systems from a single console in any location. Such capability immediately boosts ROI by enabling one person to do the job of many.

ATEN's Over the Net solutions built-in IP remote access extends management capability beyond the office to anywhere an Internet connection is available. With complete support for multi-platform configurations, ATEN's KVM Over the Net solutions are ideal for diverse settings that include Mac, Windows, Sun and Linux/Unix systems.

Call now or e-mail us at sales@aten-usa.com for an ATEN authorized reseller.

ATEN Technology, Inc.
1-888-999-ATEN (2836) | www.aten-usa.com

Entire contents copyright © 2006 ATEN Technology, Inc. All rights reserved. Reproduction in whole or part without permission is prohibited. All other trademarks are the property of their respective owners.

endian or vice versa. That also means, the best possible performance since each OS is only active when the computer is booted into it. It also means that with the proper hardware support (drivers), that the computer should be able to network well, handle all manner of multimedia bells and whistles, as well as power management tasks such as sleep, suspend, and wake-on-LAN. Dual booting means computer labs can easily be repurposed, and that companies with both Macs and PCs can easily standardize on Apple hardware.

On the minus side, dual booting is cumbersome and doesn't provide any collaborative framework. It's simply one OS or the other and end users hate it. It's not hard to remember the annoying early days of Mac OS X and dual booting with Mac OS 9. Yuck.

Apple's Boot Camp solution <<http://www.apple.com/macosx/bootcamp>> is about as slick as any dual-boot arrangement that's ever existed. It allows for allocating space for Windows, resizing that partition on the fly, easy exchange of files between the Mac OS X file system and the Windows XP disk, as well as, full driver support for WiFi, Bluetooth, the infrared remote port, full multimedia, and hardware accelerated video. In short, the same driver support you'd expect to see on a computer *that shipped with Windows*. Sweet.

Method 2: Full Virtual Machine With or Without Emulation

This is what Virtual PC for Macintosh provides. A full virtual i386 computer with functioning hardware, multimedia, network, and USB combined with a little endian to big endian instruction emulator. Often the success of such emulators depends directly on hardware support such as the 68000 emulator used by Classic, or perhaps more pertinent to this article, the "pseudo-little-endian" mode built into G3 and G4 PowerPC processors, that was dropped from the G5, causing Microsoft to have to scramble for several months to ship a working Virtual PC for the G5 processor.

Conversely, this is what PearPC made possible for PC users, the ability to run Mac OS X in a virtual machine inside a Windows XP host. However, PearPC being an Open-Source project cannot easily live up to the high standards of hardware support that commercial products like Virtual PC consistently deliver. The advantage of a virtual machine is that everything generally acts like it would on a separate computer, accessible through a window on the host OS. This keeps "Windows-like" things separate from "Mac-like" things, and so forth. However, because the guest OS runs in a window, inside an application on the host OS, it is almost always relegated to second fiddle. Think of it as the computer version of PIP (picture in picture), but for the sake of fun we'll call it OSIOS (OS inside OS).

A VM without emulation - this is pretty much the same as the situation above, of course minus the instruction translation, and that means extra speed and possibly better hardware compatibility. However, from an end-user's perspective, it is still OSIOS.

Speed... Strength... Solutions!

Portable and Desktop External Storage Solutions

Up to 1 Terabyte

Starting at just \$99.95

Other World Computing
Providing Solutions for Today's Technology Users

www.MacSales.com

**Fastest
Connection
Speeds!**

FireWire 800

FireWire 400

USB



Mercury™ On-The-Go

FireWire/USB

The Only 160GB 2.5-inch bootable shock resistant storage solution on the market Perfectly designed for the mobile work force: Data, Digital Photos, Music



Mercury™ Elite-AL Pro

World's best aluminum casing storage solution. Single enclosure and RAID up to 1 Terabyte, FireWire/USB. Ideal for high-speed, high capacity data: Home, Business, Video, Audio, Graphics



Neptune™ Value Done Right

Super quiet fanless FireWire design with data transfer over 40 Megs per Second. Quality, reliable FireWire storage up to 400GB at an economical price.



Mercury™ Elite Pro Classic

Award winning High Speed, Super Silent bootable backup and external storage in state-of-the-art shell up to 400GB. FireWire/USB Engineered for Audio, Visual, General Data, Graphics, and Backup



Other World Computing

Serving the Computer Universe since 1988

Visit macsales.com 800.275.4576

Own the Future - TODAY!

Select your solution today and save
www.macsales.com/firewire



Method 3: An "Open" Virtual Machine With or Without Emulation

An "open" virtual machine is one where the OS/IOS situation has been broken down to the point where the native window manager of the host OS handles the windows for the guest OS. Classic on a PowerPC Mac is one such example, as is Darwin (<http://darwin.opendarwin.org>) on Mac OS X. Advantages include, decreased overhead and therefore increased performance, as well as the potential to use the same file system and exchange clipboard data.

Disadvantages include a more challenging development curve, and loss of much of the potential for hardware support that a full VM provides, as well as, the increased potential for application misbehavior when they find the environment slightly different than what they expect. Typically, open VMs are written to the "letter" of the API (Application Programming Interface) standard, and expect that applications also respect that API.

Method 4: Full-Scale Eviction of Host OS

Certain emulation products, such as VMware's ESX Server, (<http://www.vmware.com/products/esx>) are installed *first*, before even the primary OS is. As a matter of fact, ESX Server *actually would take the place of Mac OS X* as the host OS, relegating all other OSes, whether Windows XP or Mac OS X to guest status. While it's unlikely that ESX server will become a

widely implemented solution for end-user's desktops, it will most definitely see heavy use on the next generation of Xserves (yet to be released), allowing them to run Mac OS X Server, Linux, and Windows 2003 Server *simultaneously*. Although VMware's products aren't currently available either as a beta or release product, company executives have publicly discussed that they are prepping a Mac OS X for Intel version, and that they have it running in their labs.

Classic: Lost in Transition

While PowerPC applications running in Rosetta are Mac OS X's new software legacy, it's obvious that Apple decided to simply cut off support for the Classic Environment partly due to the requirement of having the hardware PowerPC to 68000 emulator on the logic board of the new Intel Mac, something that probably wouldn't exactly "fit in" with the heavily Intel-engineered chipset. Also, the complexity of a two-layer Rosetta to PowerPC to 68000 emulation food chain was probably too much for Apple to support, and no doubt would be slow as molasses under the right circumstances. So, no Classic for my MacBook. However, I still need to occasionally use ResEdit (which has never been updated for Mac OS X). After all, when creating disk images for software distribution with an embedded EULA (End User License Agreement), Apple still recommends using ResEdit to embed the agreement in the disk image, even

Mac Sling

Zip it, Store it, Move it

www.mymobilejuice.com

mobile juice™



Other MacBook Pro Cases: Mac Sleeve



Singapore
JCHS Media Pte Ltd 47 Beach Road, #04-04, Kheng Chiu Building, Singapore 189683 Tel: 65-6334-6618 Fax: 65-6334-6645

Premium

Small Business Management & Accounting

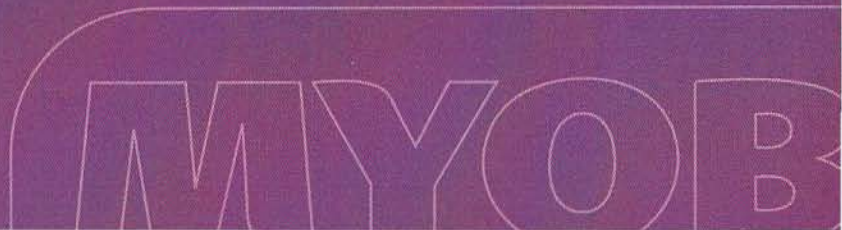
Software

Mind Your Own Business. Smarter.

800.322.MYOB (6962)

www.myob-us.com

MYOB and the MYOB logo are registered trademarks of MYOB Technology Proprietary Limited.



Project	URL	Platforms	Mac OS Version
Mini Vmac (old school fun and games)	http://minivmac.sourceforge.net	Linux X86, Mac OS X (Universal), Mac OS 9 (PPC and 68000) Windows and Pocket PC.	Up to 7.5.5 with no network support. Sound works great.
Mac-on-Linux (Classic Environment for Linux PPC)	http://www.maconlinux.org/	Linux PPC	Mac OS 7.5.2 to 10.3.3. Needs an emulator component. Not much promise here.
PearPC (The Open-Source Great Hope)	http://pearpc.sourceforge.net	Windows, Platform Independent	Will eventually run Mac OS 9.2.2 in a solid virtual machine, as it currently runs Mac OS X 10.4
Basilisk II (O-L-D) but still kicking.	http://basilisk.cebix.net/	Linux, Solaris, FreeBSD, IRIX, BeOS, AmigaOS, Windows NT	Emulates a 68000 series Mac, so it won't run anything above Mac OS 7.5.5. Has color and network support.
SheepShaver (Think ShapeShifter, somewhat viable. Needs work.)	http://sheepshaver.cebix.net/	Linux PPC, Linux X86, BeOS, Darwin/PPC	Runs up to 9.0.4 with sound and color. LAN support.

Table 1.

though there's other excellent and elegant solutions, such as DropDMG <<http://c-command.com/dropdmg>>, it would be nice to be able to use ResEdit. I also am the proud ornery owner of Apple's last great Laser Printer, the LaserWriter 8500, which can only be configured by the Apple Printer Utility, which, of course, only runs in Classic and with Appletalk, and of course there's still an occasional Classic utility or two I need to run, just to feel "connected" with my Mac past.



Figure 2. No Classic Applications Allowed.

As easy as it is to find an open-source emulator or commercial emulator to run Windows or Linux on a Mac OS X computer, it's no easy task to find a decent Classic Mac OS emulator that runs on top of an Intel processor that can support Mac OS 9.2.2 with access to all hardware resources, such as the sound manager and Open Transport. There have been several for Linux and Windows, but none have been under heavy development since the advent of Mac OS X, other than Mini Vmac, which only supports Mac OS 7.5.5 and lower, while others have been abandoned altogether. Here's the short list of possible Classic stand-ins I've found, and a quick synopsis of their current state of development: (See Table 1.)

Mini VM

It's easy to see that many of the Classic Mac emulation solutions are pretty long in the tooth, or at least emulate versions of Classic that really old. MiniVmac emulates a Mac

Plus nearly perfectly, and at an amazing speed (it's a Universal application, and includes a necessary CPU throttle to slow it down so it's useable). It also requires a hardware ROM dump from a Mac you "currently own," a tricky legalism leftover from the beige box days that must still be obeyed. MiniVmac really gets the job done, if your Classic needs are frozen at Mac OS 7.5.5. Once in a while, I'll stumble across some specialty application or display still run by a Classic Mac, such as an SE/30 or a Mac Plus. Such a setup *screams* for a Mac Mini, yet the current Minis have Intel inside. It's even possible to run MiniVmac off a keychain drive. As such, MiniVmac is almost a perfect solution for such a need on an Intel Mac Mini, even if sound is necessary, unless access to a network or some other type of serial-port driven controller is necessary. If that's the case, only the real thing will do. MiniVmac also features a full-screen mode, so you can work with Clarisworks 1.0 on a LCD projector! To get started with MiniVmac, visit <<http://minivmac.sourceforge.net>>. Getting up and running with MiniVmac is easy, there's even starter disks available.

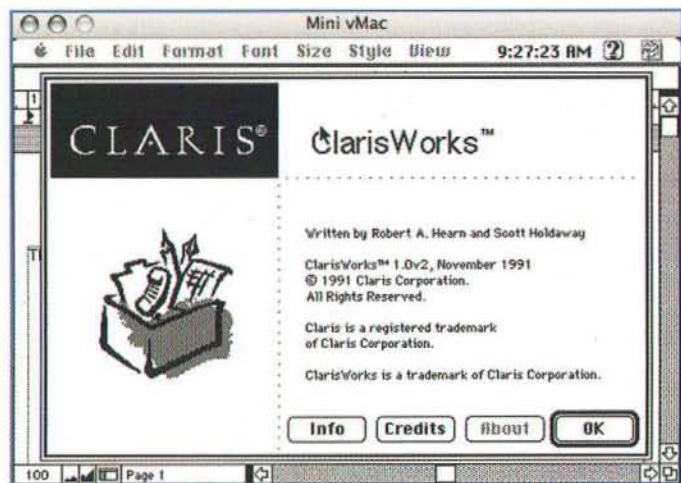


Figure 3. MiniVmac in Action.

A Partridge in a Pear Tree

However, it's PearPC that holds out the greatest promise here, as soon as it gets the necessary virtual hardware support to run Mac OS 9. After all, it's PearPC that was the first Mac OS X on X86 solution, running the entire PowerPC install in a sloooooow emulator, all but unusable except for on the fastest PCs, which now look a whole lot like the fastest Macs. For running Classic, however, it's pretty clear that performance would be more than acceptable. As a matter of fact, because the PearPC code is platform independent, a few more tweaks could make it a serious Open-Source challenger to other commercial VMs with or without an emulator. As soon as PearPC gains OpenBios support, it will very likely boot Mac OS 9 as well as Mac OS X. Keep an eye on the action here at the PearPC community forum: <<http://pearpc.net>>.

Counting Sheep

As of today, the only way to emulate a Mac running OS 9 or higher on a new Mac with an Intel processor is SheepShaver, an oldie but goodie that grew out of the Basilisk II emulator project. Originally, SheepShaver (which gets its name from "shape shifter") was to be a solution for running Mac OS Software on BeOS systems. It's an interesting historical tidbit that Gilbert Amelio once considered acquiring BeOS to replace the Classic Mac OS, but eventually settled on OpenStep, and bringing Steve Jobs back to Apple. The rest, as they say, is history. SheepShaver has survived as a little-used Classic emulator, but now with the emergence of Macs with Intel processors, it's gaining more attention. I just wish someone would make a new icon for the program! Getting started with SheepShaver starts off with a trip to: <<http://www.gibix.net/dokuwiki/en:projects:sheepshaver>>, where the "experimental" port to Mac OS X for Intel lives. Please note that getting SheepShaver going, currently requires access to a PowerPC Mac with Classic installed, and a Mac OS 9.0 or 9.1 install CD. Mac OS 9.2.2 is *not* going to work with the current port of SheepShaver.

1. After downloading SheepShaver, download the Mac_OS_ROM_Update_1.0.smi from Apple's support site

Long Distance

2.9¢ Per Minute!

Straight 6 second billing increments

Excellent rates on intrastate, intralata/toll calls and international calling with no term contract.

Toll Free (800/888/877/866) service, same low per minute rate for incoming calls.

10 cents per minute calling card.

Detailed billing directly from OPEX.

Quality electronic and telephone customer support.

No monthly billing fee if your bill is over \$20.00 each month.

(NOTE: \$2.00 billing fee is charged when your bill is under \$20.00.)



www.utilities4less.com

2. Download a copy of TomeViewer from <http://macupdate.com>
3. Extract the Mac OS ROM file, using Tome Viewer
4. Create a virgin file system using the DD command: `dd if=/dev/null of=sheepshaver.img bs=1024k count=number of megabytes you want`
5. Next, you'll have to create a `.sheepshaver_prefs` file and populate it with the proper settings. here's the contents of mine:

```
extfs /
windowmodes 7
screenmodes 0
seriala /dev/cu.Bluetooth-Modem
serialb /dev/null
bootdrive 0
bootdriver 0
ramsize 167108864
frameskip 8
gfxaccel true
nocdrom false
nonet false
nosound false
nogui false
noclipconversion false
ignoresegv false
pollmedia true
jit true
jit68k false
keyboardtype 5
keycodes false
mousewheelmode 1
mousewheeliness 3
dsp /dev/dsp
mixer /dev/mixer
ignoresegv false
idlewait true
rom /Users/dean/SS/MacOSROM
extfs /Users/dean/SS/shared
disk /Users/dean/SS/ss.img
ether slirp
```

Make sure, all of the disk and ROM files are in the proper locations, insert a Mac OS 9 install CD, and if all goes well, SheepShaver will start up off the CD. In which case, you're going to need to format the raw disk you created, using the `dd` command and install Mac OS 9 onto it. If all goes well, you'll be running Mac OS 9 in no time. You'll also have access to files outside the SheepShaver VM. Just don't expect the networking to work well, and expect some (OK a lot) of System Errors.

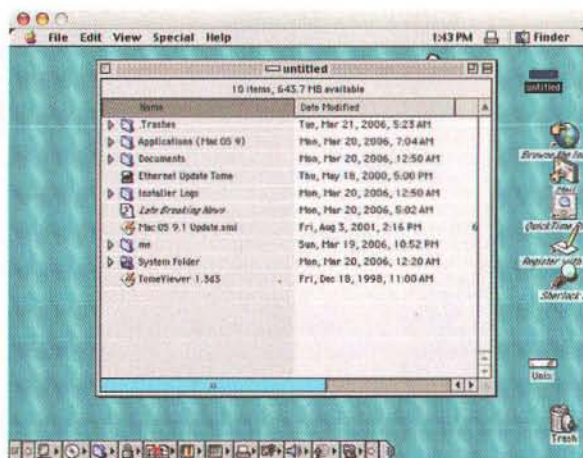


Figure 4. Mac OS 9 Desktop from SheepShaver.

If you still rely on Classic software solutions for your day-to-day work, it's best not to give up your PowerPC-based Mac right now. Better yet, if you have a mission-critical solution such as a database that can't be easily converted to a Mac OS X version, (yes there are some out there that have no easy upgrade path), then it's probably a good idea to upgrade your hardware to brand-spanking-new PowerPC metal, while it's still available, because when they're gone, they're gone; or start a transition/migration project *right now*. Eventually, a solution with commercial support will appear that allows Intel Mac owners to work with Classic software, but it's most likely going to be an entire virtual machine (think Virtual PC), rather than a transparent environment sharing the Desktop like it is in the PowerPC version of Mac OS X, and might even take as long as six months before it becomes a useable solution. So, until the pears ripen or the sheep are more closely sheared, no Classic for you!

Boot Camp: Apple Does Windows!

My MacBook slices through the most complex computing tasks using the Xcode GCC compiler. It dices the most frilly web pages and roasts its PowerPC-based predecessor in sheer boot speed. But its real promise lies in the potential compatibility with Windows and Windows applications, as well as Red Hat Enterprise Server, and with virtualization products like VMWare, which would allow for multiple i386 OSes running on the same piece of hardware. When it came to running Windows, of course, the real allure of ordering an Intel-based Mac was simply "the possibilities."

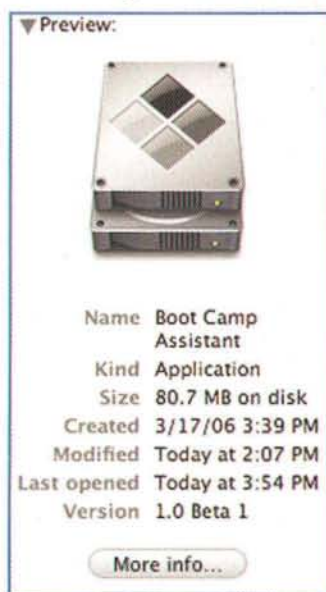


Figure 5. Boot Camp Assistant.

Well, the possibility is now a reality. Apple's Boot Camp software is an official (but unsupported) public beta of a dual-boot solution that just plain works. Get the Boot Camp Public Beta installer at <http://www.apple.com/macosx/bootcamp>; it's an 83 megabyte download. To install Boot Camp, simply update your Intel-based Mac to Mac OS X 10.4.6 and apply the necessary firmware update. You also need at least 10 gigabytes of free space a blank recordable CD, and a genuine retail (not OEM) copy of Windows XP Service Pack 2, Home or Professional Edition.

First, run the Boot Camp Assistant, and use the blank CD you set aside to create a driver disk so that when you install Windows XP, all the hardware will work properly:



BookEndz

**17"
Now
Shipping!**

DOCKING STATIONS

**MacBook
Pro Dock
available in
July!**

Convert your PowerBook or iBook to a desktop system in seconds without misplacing cables or damaging connectors.

New Higher Resolution G4 15" - 17" PowerBook Docking Station



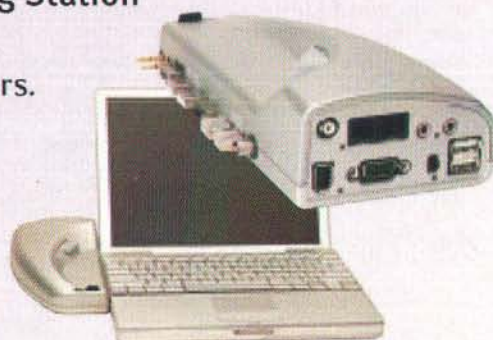
- Eliminates cable confusion and damage to connectors.
- New release levers for easier docking and undocking.
- Adds only 3" to rear when docked.
- Also available for G3 PowerBooks.

iBookEndz Docking Station



12" G4 PowerBook New Higher Resolution Docking Station

- Aluminum look to match your PowerBook.
- Eliminates cable confusion and damage to connectors.
- All connectors are routed to the rear of the Dock.
- The Dock converts RGB to standard VGA connector.
- Streamlined design complements your PowerBook.
- Use internal or external speakers.
- Easy to use ejection system.



Check our Web Site for latest product announcements



BookEndz - Manufactured by OlympicControls Corp.

1250 Crispin Drive, Elgin, Illinois 60123

Phone: 888-622-1199 • Fax: 847-742-5686 • www.bookendzdocks.com

www.bookendzdocks.com



Figure 6. Boot Camp – Burn Driver Disk.

It's very clever how the Boot Camp Assistant prompts you to create a driver disk, so that you have it handy when it comes time to install Windows XP. Next, you'll have to decide how much space from your hard drive you want to dedicate for Windows, and Windows Software. Again, Apple couldn't have made this any easier. No reformatting required. However, a backup of critical data at this point couldn't hurt.

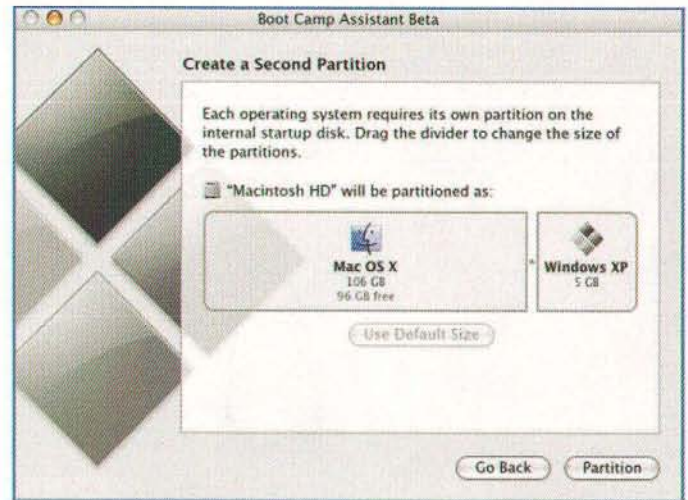


Figure 7. Create Boot Camp Partition.

Finally, we have the ability PC users have had for ages: the ability to split, and then resize live partitions without a reformat and backup. It seems that this is something that the new GPT (GUID Partition Format) allows for, that the venerable APM (Apple Partition Map) format didn't natively support. In checking the Disk Utility Application, I saw nothing new, but in checking the `diskutil` command in Mac OS X 10.4.6, I noticed something that might hint at abilities, much like the Boot Camp Assistant in future Apple OS releases:

Speech Recognition for Mac OS X



Power of Speech

MacSpeech's exclusive TalkAnywhere™ technology allows you to use your voice to enter text into virtually any application.

Always Learning

CorrectAnywhere™ - another MacSpeech exclusive lets you use Correction without leaving the application you are using. This allows iListen to learn new words and improve your voice profile while you use the program.

Ready to Work

iListen makes it easy to control your computer. From wake to sleep, command and control nearly every function of your Mac with your voice.

Get a FREE BBEdit ScriptPak with any purchase from our online store.

Use the coupon code FREE-BBEDIT when checking out. The BBEdit ScriptPak allows you to do almost anything in BBEdit using your voice!

See www.macspeech.com/promo/bbedit.html or call (603) 251-1477 for more details.

MacSpeech

Runs on the new Intel based Macs too!



LOOK FAMILIAR?



Get Rid of Your Fax Machine!

Receive your faxes directly to your email account
as PDF file attachments

Service available in over 150 area codes



To check out special offers
for MacTech readers, visit
www.MaxEmail.com/MacTech

maxemail[®]


```
macbook:~ dean$ diskutil
Disk Utility Tool
Utility to manage local disks and volumes.
Most options require root access to the device

Usage: diskutil <verb> <options>
<verb> is one of the following:
resizeVolume (resize a volume, increasing or decreasing its
size)
```

Once the disk is partitioned, the next step is to start the installation of Windows XP, followed by the driver's you burned onto the CD a minute ago. Once you've successfully booted off the Windows XP installer, entered your product key, and installed the drivers from the disk, you're ready to rock and roll. To start up from Windows XP, all you need to do is hold down the option key at startup, and choose the right partition:



Figure 8. Choose Windows or Mac OS X Boot Disk (Option Key).

Of course, this would be quite a pain in day-to-day use (dual-booting, though a nice capability, is awkward enough on its own). Apple, though, in staying consistent with its incomparable design philosophy and end-user touch, makes certain tasks like picking a boot disk a joy.



Figure 9. Selecting Windows Boot Disk From Startup Disk.

However, there's been a lot of talk about using the Boot Camp partition with other virtualization solutions such as Virtual PC for Intel Macs (when it comes out). That would truly be the best of

both options, as they say: boot into Windows XP natively when you have the need for full access to the hardware (like for gaming), or use a virtual machine with the same partition when you just want to use a Windows program for a little while. I am currently looking for two matching USB joysticks with strong suction cups, so I can attempt to fire up my old DOS-based Williams Arcade package, and fire up Robotron, *on my Mac!* Woohoo!

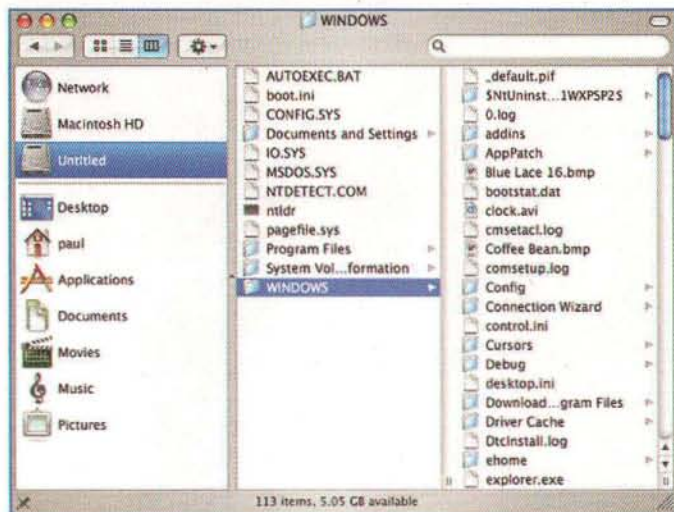


Figure 10. The Boot Camp Partition/

A Closer Look at the VMs: Virtual PC et. al.

Although I had some flirtations with the PowerPC builds of Bochs (<http://bochs.sourceforge.net>) and QEMU (<http://fabrice.bellard.free.fr/qemu>), Virtual PC had the details down that the Open-Source Virtual machine contenders couldn't seem to pull off consistently: a graphical interface for configuring the virtual hardware, and hardware compatibility that was unmatched. Networking and USB support actually worked to the extent where you could sync a PocketPC with it with the emulated Windows System, or safely join a Windows domain. Multimedia applications worked as expected, albeit slowly. On the flipside, Open-Source emulators like QEMU performed reasonably quickly, but installing Windows on QEMU was a crapshoot, sometimes it would work, sometimes it wouldn't. Reading from the CDROM drive was inconsistent. A kernel extension was required for networking support. USB support, fahgetabahit! Sound? No way! Bochs, although it was more consistent, was difficult to configure, and was so slow, it was almost useless. Both Bochs and QEMU can be somewhat difficult to configure, though recently that's changed, especially for QEMU. There's been a company (who I won't name) who's developed a GUI for Bochs and QEMU, and has sold it as a commercial product. Read the rest of this article carefully, and note that I don't review that solution. That's an intentional omission.

Over the years, it has been Virtual PC (originally developed by the magical Mac OS hacking company Connectix of Virtual Playstation fame), now a Microsoft Product, that became the gold

Be the one with all the answers.

See the new MacTech Magazine.



Make your Mac fly!

Get under the hood.

MacTech is already read every month by tens of thousands of readers.

MacTech readers represent the very heart and soul of the the Mac community. Join the crowd and sign up for MacTech today!

For a one year subscription visit:

www.mactech.com/riskfree

Phone: 877-MACTECH / 805-494-9797

standard for running any guest OS, which required the i386 architecture on a PowerPC-based Mac. Five years ago, I used to travel around the country delivering IT training courses, including Mac OS Troubleshooting and Networking, Windows NT Server, and Novell Netware. I used to teach *all* of the workshops using two PowerBook G3s running Virtual PC 3.0. I even developed the habit of covering up the white Apple logos on the back of the PowerBook with yellow stickies, and then pulling them off (ta-da!) in the middle of the training to stunned gasps, "I didn't know Mac could do *that*." If anyone remembers, Apple's adoption of the G5 processor slowed down the pace of Virtual PC development because the PowerPC G4 processor supported something called "Pseudo little-endian mode," which the G5 didn't, causing a six-month delay before the release of Virtual PC 7.



Figure 11. Virtual PC Icon.

Now that Virtual PC 7 has been out for over a year, it's fair to characterize it as a pretty awesome combination of emulator and virtual machine, with a long track record going back to 1998, and successes far beyond that of most mortal software. And you'd think, with Apple switching to Intel processors, that Virtual PC might have finally run its course as a solution, and may now find itself an end-of-life software product. But, quite the contrary is true. Virtual PC, because of its mindshare and incredible polish as a program, is poised to become the premier Windows-on-Mac OS X solution. Even its familiar brand name is comforting to the end

user. Installing Virtual PC is a snap, as it comes with a license for Windows XP Professional, all set up and ready to go. As far as performance goes, you couldn't ask for anything more from a big endian to little endian emulator. It even has touches like a Windows "Start" menu that sits in the Dock.

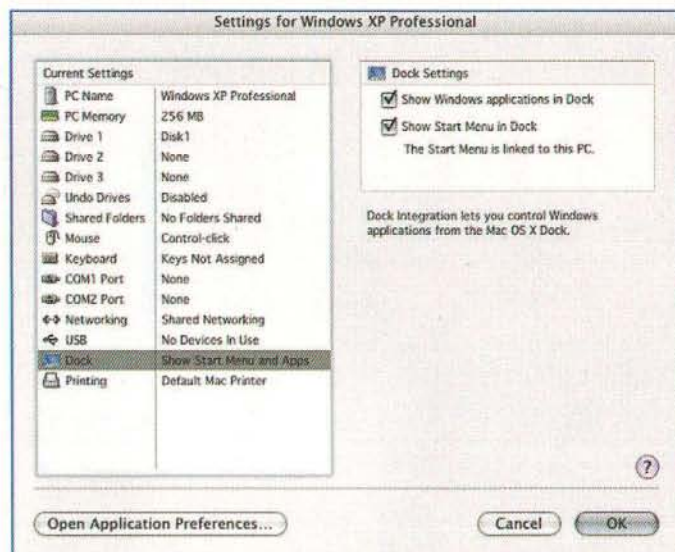


Figure 12. Virtual PC VM Settings.

Installing Virtual PC is a snap, simply insert Install disk one, start the installer, insert install disk two, and follow the prompts. As a matter of fact, it's quicker to install Windows XP

Connect • Communicate • Collaborate • Securely

Because meetings are more productive when people are on the same page... of their calendars

Get the message



Kerio MailServer

A groupware alternative to Exchange that syncs calendars, contacts and email with Entourage and Outlook. Integrated anti-spam and McAfee virus filtering provide secure, junk-free email for users on any platform.

Mac OS X • Linux • Windows

www.kerio.com

McAfee
Proven Security™

KERIO

Professional under Virtual PC than it is on most real PCs. Performance is a bit "heavy," due to the emulation, but highly acceptable on my dual G5 2.0 ghz with 2 gigs of RAM, as long as I stick to productivity applications, and not games or anything involving sound or video. However, when sound does emanate from Virtual PC, it comes out in full synthesized stereophonic glory, not some ratty 8-bit distorted groan other emulators have been known to make. Likewise, everything simply works as expected, from the virtual hard disks that grow when they need more space to the virtual access to the file system on the host Mac itself. It's impossible to find any rough edges on Virtual PC.

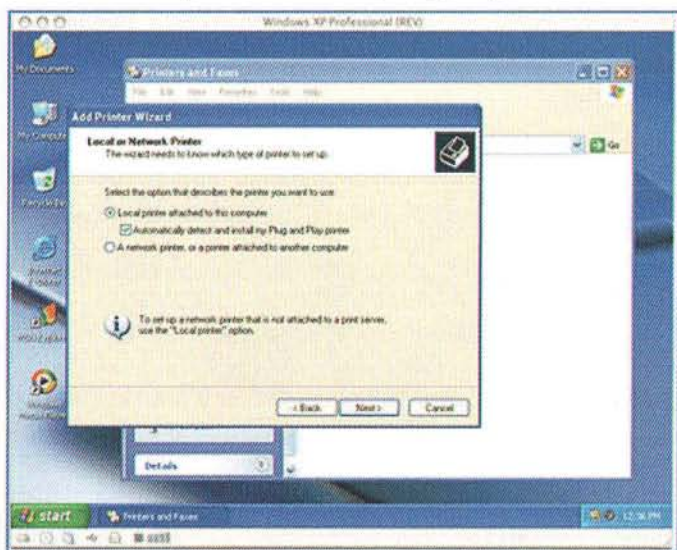


Figure 13. Virtual PC on Mac OS X (PPC).

Although Microsoft has lost the race to market to the open-source Q and Parallels (read on), VPC for Intel Macs may be worth waiting for, as it'll have a polish and finish other solutions might not, not to mention the stellar reputation and support system of the world's largest software company behind it. One look at the Virtual PC for Mac device compatibility chart at Microsoft Mactopia: <http://www.microsoft.com/mac>, and it's easy to see why VPC is worth waiting for. Anyone who says Microsoft has "lost the Mac emulation race", hasn't seen this. We'll all be the winners for the extra competition, no matter what happens. Microsoft already has its popular Virtual PC for Windows product, which could be ported to run on Mac OS X for Intel. One the other hand, it might be easier for Microsoft to port Virtual PC for PowerPC to Mac OS X for Intel, and simply drop the emulation component, keeping the virtual machine. Currently, Virtual PC for Macintosh simply won't run on the new Intel Mac hardware.

Windows VM for Free? Caveat Emptor.

Well, possibilities become realities, and now I'm happy to report that three former Open-Source emulation projects now support Mac OS X for Intel natively. Why "former" emulation projects? Because in the case of each one, the need for instruction-level endian emulation

has been alleviated by the compilation on and for the new Intel Macs. However, not all "free" Open-Source emulation solutions are created equal, and in one case, it's quite clear that a commercial variant is not a whit better than its free counterpart.

First, Q:

The Q <http://www.kberg.ch/q> project adds a nice GUI and Assistant to the QEMU <http://fabrice.bellard.free.fr/q> emulator I've been using for the past two and a half years. Q is about as close to Virtual PC as I've seen, and for an open-source project, my hat is off to the developers. Performance is also excellent. They've done away with the need for the tun/tap kernel extensions that older versions of QEMU required, so that the networking just works, with no further fuss.

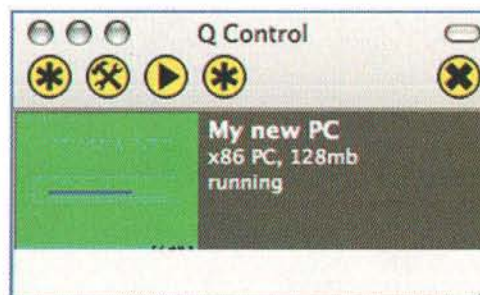


Figure 14. Q VM Control

Installing Windows XP Professional on Q simply won't work at the time of writing this article, because of some incompatible interactions between the installer and the emulator. For now, you have to install Windows XP Professional and Service Pack 2 on a

**Gas is Getting Expensive.
Time is Gas.
The Internet is NOT a cloud.**



**It's your Help Desk.
(might as well be global)**

**Mac HelpMate Professional
Zero-Configuration/Branded
Remote Support Service.
(a real good thing)**

PCC running Q (yes, it runs on PPC hardware too, just slower), and move the VM (in the QEMU folder in ~/Documents) over to an Intel Mac), and then you're in business.

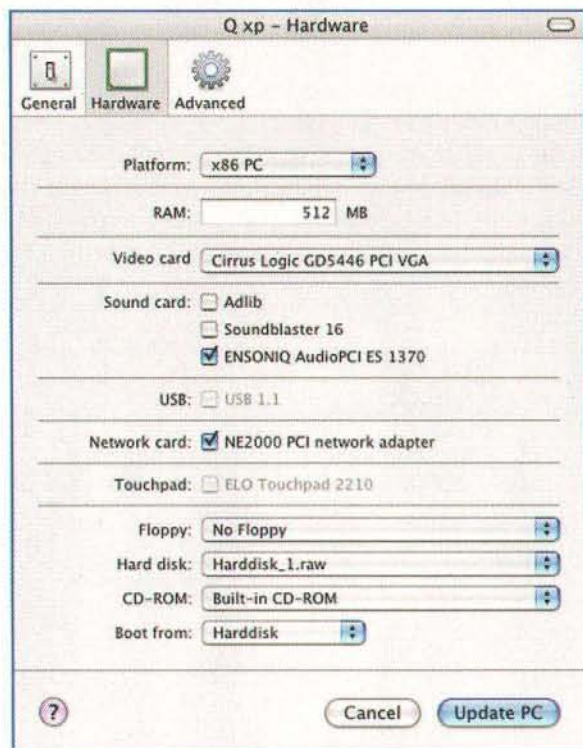


Figure 15. Q VM Settings.

As it stands now, Q on Intel Macs is highly useable, and much faster than VPC on a fast G5. It even allows access to the Mac's files system when running, something that Parallels (see below) doesn't yet support. However, it's quite clear from running Windows XP with Boot Camp that Q (and QEMU) does eat up a lot of processor cycles, doesn't multitask well, and doesn't have graphics acceleration (meaning no widescreen modes), and no sound. However, it's come so far in the last year and a half, I wouldn't be surprised if Q didn't become a standard solution for many power users, and of course for the occasional use of a Windows accounting program or Access 2003, it's impossible to beat Q's price.

Second, Parallels:

A newcomer to the Mac OS X (and Linux, and Windows) VM scene is Parallels workstation. As far as I know, Parallels is strictly a Virtual Machine, and includes no emulator. However, even in its current public beta form, it's obvious that Parallels is already a highly mature product, and a serious contender for the VM title.



Figure 16. Parallels Workstation Logo.

Working with Parallels workstation yielded some pleasant and not-so-pleasant surprises. First, Windows XP Professional booted up normally, but failed to read several critical files during the installation process. I found that disabling the hardware acceleration during the installation process, allowed the installation to proceed and finish. Also annoying was Parallels' inability to recognize an optical disk inserted after the VM was booted, or release that disk until the VM was shut down. Also, Parallels currently has no method for sharing files with its host OS, something that needs to be resolved sooner rather than later. Also, the interface for configuring the Parallels virtual machine is rather un-Mac-like, compared to Virtual PC and even Q. It also contacts two kexts (kernel extensions), and did cause a kernel panic once when switching video modes.

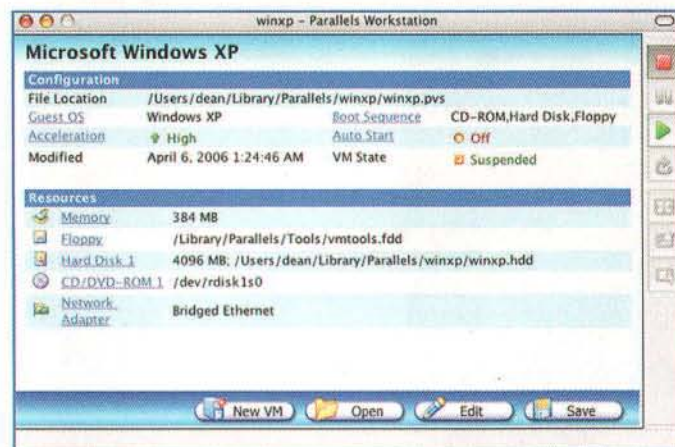


Figure 17. Parallels VM Configuration.

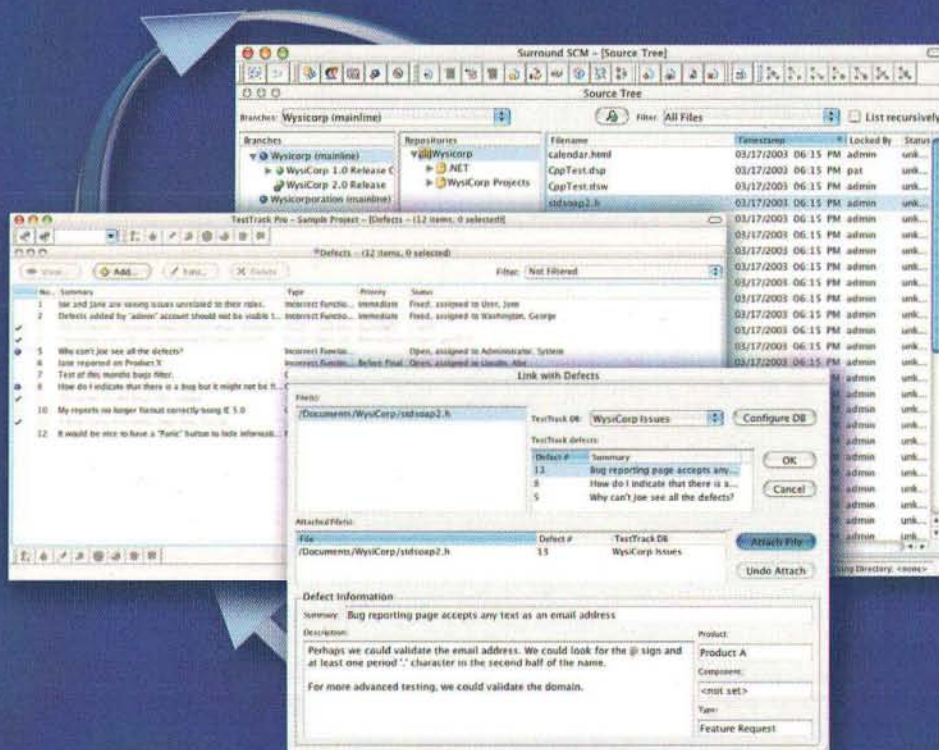
On the plus side, Parallels is fast, very fast. It takes advantage of hardware acceleration for virtualization technology built into some Core Duo processors (supposedly the iMac and MacBook *have* this capability while the Mac Mini does not). The graphic acceleration is also much better, supporting widescreen modes that match the MacBook Pro and the iMac. The price (\$50) is also right, though Parallels seems very much like a Beta right now. However, if the developers can perfect Parallels, I'd imagine they could easily charge \$100 per seat. By the way, don't try using the Boot Camp video drivers with Parallels (someone has already tried that, and well, it hosed their VM), and it's probably not a good idea to try booting Parallels off of the Boot Camp partition—yet.

Third, Darwin:

In my January MacTech column, I flagged Darwin <<http://darwin.opendarwin.org>> as the project to watch. Well, in between MacWorld and this writing, the Darwin project released its first build with native i386 support for Mac OS X. Currently, Darwin is too rough (I'd say Alpha quality at best) for production use. However, it's easy to see the promise of Darwin—applications launch instantly and respond more quickly than in any VM. However, to get

Complete Source Control and Defect Management for Mac OS X

Seapine Software™
changing the world
of software development



Effective source code control and defect tracking require powerful, flexible, and easy-to-use tools—Surround SCM and TestTrack Pro

- Complete source code control with private workspaces, automatic merging, role-based security, and more
- Comprehensive defect management — track bug reports and change requests, define workflow, customize fields
- **New!** Full Unicode support maintains international characters across various languages, ensuring data is not lost or misinterpreted
- Advanced branching simplifies managing multiple versions of your products
- Fast and secure remote access to your source files and defects — work from anywhere
- Scalable and reliable cross-platform, client/server solutions support Mac OS X, Windows, Linux, and Solaris
- Exchange data using XML and ODBC, extend and automate with SOAP support
- Licenses priced to fit your budget

Seapine Software Product Lifecycle Management
Award winning, easy-to-use software development tools

Seapine
Surround SCM
Seapine
TestTrack PRO



Download Surround SCM
and TestTrack Pro at
www.seapine.com/mac
or call 1-888-683-6456

all product names listed herein are registered trademarks of their respective owners. All rights reserved.



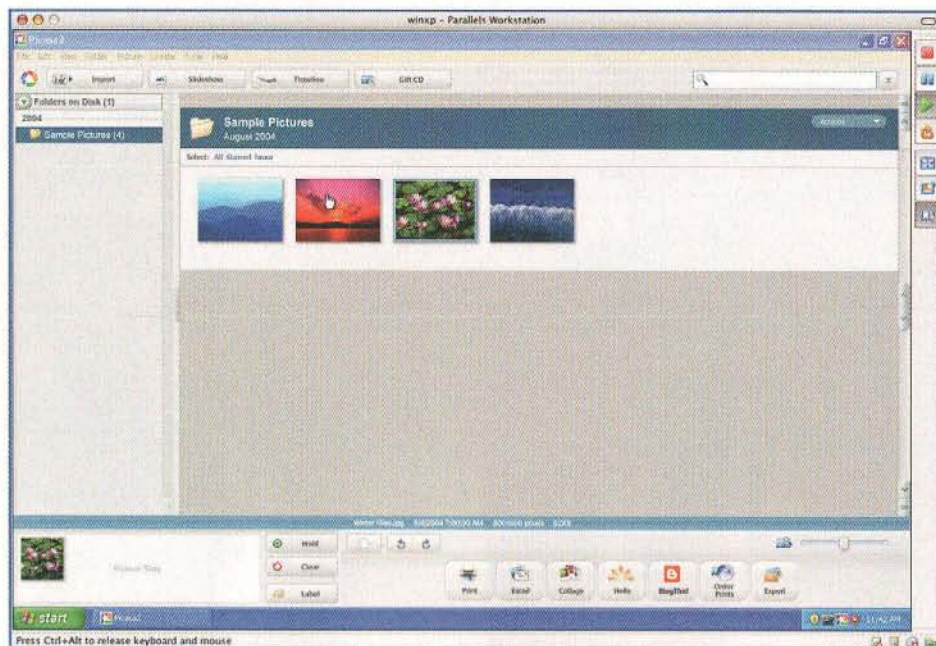


Figure 18. Parallels, Windows XP Professional, and Picasa.

Darwine installed properly, requires a lot of command-line tweaking (and crashes a lot), so I'm going to hold off on covering it in depth until it stabilizes, probably in three or four months at a minimum. For now, here's a screenshot to tantalize you:

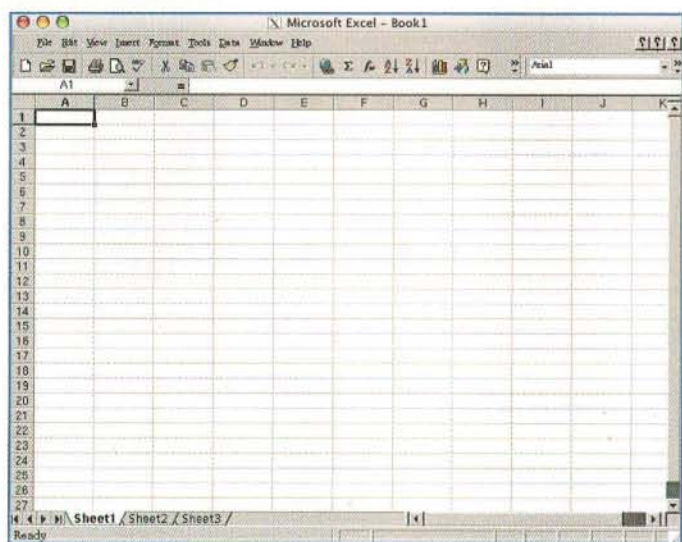


Figure 19. Microsoft Excel 2000 Running Under Darwine.

So What Does This Mean for the Big Picture?

In my January MacTech column I wrote:

And Apple knows where Microsoft's bread is buttered as well. A company with an open-minded CTO who

loves open-source and the quality and security of Mac OS X on Apple hardware may realize that deploying XServe G5s would save his company a bundle in annual CAL payments, but cannot even begin to consider putting a Mac OS X computer in his employee's cubicles until a critical database front end, created in some Windows-specific IDE like Powerbuilder will run under Mac OS X.

Well, we're getting closer and closer to that reality. Most Mac Consultants and Admins that I know, are currently running some form of Windows compatibility solution on their MacBooks, iMacs or Minis with Intel processors, where just a year or two ago they might have echoed Apple's party line of "we don't *do* Windows." With

Apple's assertion that it "wouldn't do anything to anything to *prevent* people from using Windows" on Intel Macs after the transition announcement at WWDC last June, it's *very* telling that Boot Camp was released so soon after the new Mac hardware. It can't be coincidental. The next generation of Xserves, and the availability of VMware ESX server will tell another story. Many people realize that the battle to displace Microsoft solutions from the Enterprise, Consumer and Education markets cannot necessarily begin with marketing the advantage of Mac OS X over Microsoft Windows, but the advantages (and now flexibility) of owning a Macintosh computer. Apple's not going after Microsoft's software business, but the hardware businesses of Dell, HP and IBM. The message is crystal clear: "One operating system isn't good enough anymore. One computer or server is."

MI

About The Author



Dean Shavit is an ACSA (Apple Certified System Administrator) who loves to use a Mac, but hates paying for software. So each month he's on the hunt for the best Open-Source and freeware solutions for OS X. Besides surfing for hours, following the scent of great source code, he's a partner at MOST Training & Consulting in Chicago, where he trains system administrators in OS X and OS X Server, facilitates Mac upgrade projects for customers, and writes for his own website, <www.themachelpdesk.com>. Recently, he became the surprised father of an application: Mac HelpMate, available at <www.machelpmate.com>. If you have questions or comments you can contact him: <dean@macworkshops.com>.



DUCK.



DUCK.



DUCK.



GOOSE!

WORKING THROUGH
SURPRISES REQUIRES
THINKING DIFFERENTLY.

WE CAN HELP.

DON'T LET YOUR GOOSE
GET COOKED...LOOK TO US
FOR THE STRAIGHT STORY ON
HOW TO MAKE THE MOST
OF YOUR WINDOWS NETWORK,
EXCHANGE & OUTLOOK

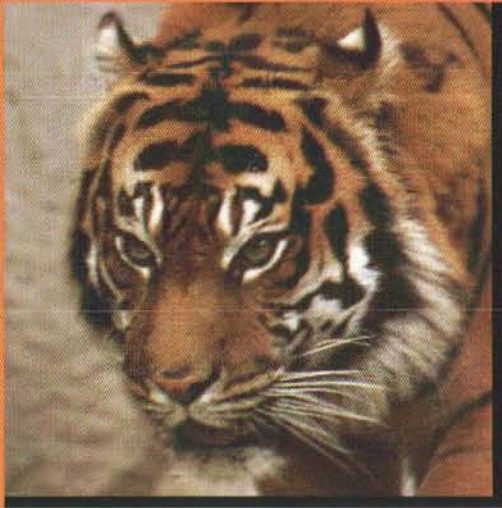
EMAIL ISSUES, AND
SECURITY CONCERNS—

WITHOUT ANY
MICROSOFT SPIN.

WINDOWSITPRO.COM

WINDOWS IT PRO.
THE LARGEST
INDEPENDENT
WINDOWS
COMMUNITY
IN THE WORLD.

WindowsITPro
CONNECTING THE IT COMMUNITY



TWEAK TIGER'S TFTP

BY AARON ADAMS

As the networking infrastructure guy, I occasionally have the need to update hardware or backup settings using the TFTP protocol. Tweaking TFTP in Panther required editing a file in `/etc/xinetd.d/` that no longer exists in Tiger since `xinetd` has been deprecated in favor of `launchd`. No worries, however, because you can make TFTP work in Tiger. It's just that the steps to get there are a bit different. It requires use of the Terminal, but you're good enough, you're smart enough, and... we'll just leave it at that.

Tiger starts the TFTP service based on settings specified in the file `/System/Library/LaunchDaemons/tftp.plist`. That file contains the command to start the daemon and the optional switches associated with it. By default, the only switch in the plist file is `-i /private/tftpboot`, which is separated out into two individual program arguments, but is logically a single option. According to the man page for `tftpd`, the `-i` option means "Enable insecure mode, no realpath". In all honesty, I'm not sure what that means precisely, but it sounds like no filesystem path is assigned to where TFTP can read and write files. We can fix that.

The first thing to do is make a backup copy of the original `tftp.plist` file because if bad things happen, we want the ability to start over clean. In the Terminal, copy it with this line:

```
sudo cp /System/Library/LaunchDaemons/tftp.plist  
~/Desktop
```

Let the editing begin!

```
sudo nano /System/Library/LaunchDaemons/tftp.plist
```

Find this line:

```
<string>-i</string>
```

and replace `-i` with `-s`.

Find this line:

```
<string>/private/tftpboot</string>
```

and replace it with

```
<string>/path/where/you/want/files/saved</string>
```

(`/Users/yourname/Public` might be a good choice.)

Press **control-x** to exit and save the plist file.

Start up the TFTP server:

```
sudo service tftp start
```

If you're using Mac OS X's built-in firewall, be sure to open UDP port 69.

TFTP is purposely a dumb protocol. It requires no authentication, so it can't create files and can only write to files that are publicly writable. So before any data can be saved via tftp to a file, that file has to be created and made publicly writable at the local machine by the user.

To create a file:

```
touch /path/to/file.name
```

And then to make it publicly writable:

```
chmod 777 /path/to/file.name
```

After a hard day of TFTPping, the service can be stopped with:

```
sudo service tftp stop
```

MM

About The Author

Aaron Adams is a Mac consultant and network whipping boy located in Dayton, Ohio. You may also remember him from Apple's "Switch" campaign a few years ago. You can e-mail him at aaron@aaroadams.net.

MACTECH
M a g a z i n e

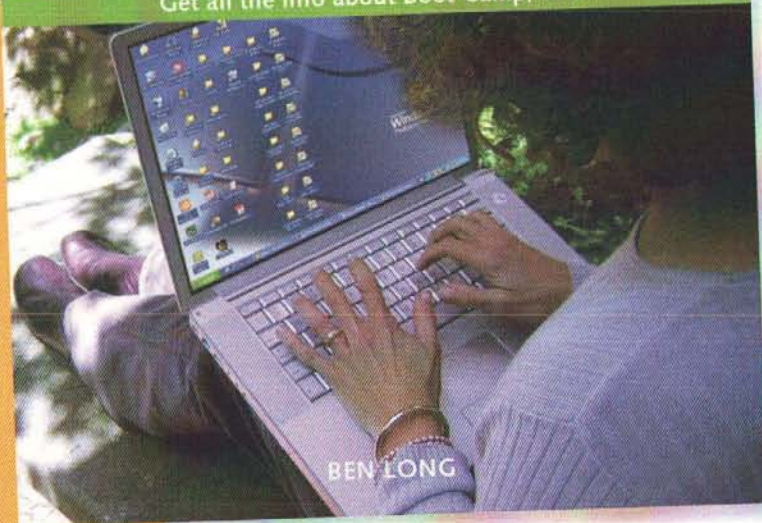
store.mactech.com/riskfree

Windows XP on a Mac?

Maybe pigs can fly!

Apple **Boot Camp** Public Beta **First Look**

Get all the info about Boot Camp, first.



Apple Boot Camp Public Beta First Look eBook can help your Mac Fly too!

You will learn how to:

- Get Boot Camp up and running on your Intel-based Mac
- Avoid Windows viruses and malware
- Configure your Windows system
- Share data with your Mac partition
- Back up your Windows system
- Run a virtual copy of Windows within the Mac OS
- Much, much more...

All for only **\$6.99**, simply visit
www.peachpit.com/bootcamp
to download your copy today!



www.peachpit.com

ATEN's MasterView Max (CS1758) KVM Switch

The Differences in KVMs

When MacTech moved offices last year, we were looking for ways to consolidate the number of servers that we had, as well as the amount of electricity being used in the setup. One of the easiest ways to do this, is a KVM ... a keyboard/video/monitor switch.

There are a wide variety of vendors out there that make KVMs. We've found that there are a few reasons to choose one vendor over another: speed, quality, and features.

Speed may seem like an odd thing to apply to KVMs, but if you are the impatient type, you want a KVM that is responsive. That's just one of the differences between the cheap KVMs that you may see, and a professional grade KVM.

Since we wanted to have the ability to have non-Macs in our server room, we wanted to make sure that we could handle not only a USB interface, but also PS/2 for keyboards, etc... For this reason, we selected the ATEN product. ATEN does a great job of supporting the multiple interfaces through their cables. They all connect the same way to the back of the KVM, but the other end of the cable is a USB or PS/2 connector as appropriate.

One of the other nice features of the ATEN product is the ability to do on-screen programming, so that you can identify the machine you are working with. For example, if you press switch 3, you want to know that, that is your "FileMaker Server", and as

a result, you can have that display on screen. You'll see more about On Screen Display below.

There are other features like auto-scans, where you can have the KVM go from one machine to the next on a time interval. The ATEN products do this, and other features very well.

Specifics

Eight-port MasterView Max (CS1758), is a multiplatform KVM (Keyboard, Video, Mouse) switch that enables control and access of up to eight computers from a single USB keyboard,



USB mouse, and monitor console. MasterView Max allows system administrators to do away with expenses and efforts involved with redundant hardware, providing them with the option of configuring up to 63 additional CS1758s, in a three-level arrangement, to control up to 512 computers from a single console. The multi-platform support, facilitates control of Macs,

air power



Introducing The Bird Killer



**No surgery
required!**



**Works for
all models
& speeds**

Also available...

Antennas

Whips | Plug n' Plays
Base Station



Transceivers

Base Station | Mac Mini
Power Mac



Handles

PowerBook | iBook
TiBook



Signal. Strong signal. That's what you'll get from this inventive new wi-fi extending product from QuickerTek. The Bird Killer attaches to the outside of any iBook or Powerbook — no internal tinkering needed! To learn more about this, and other Mac-friendly inventions, visit www.quickertek.com

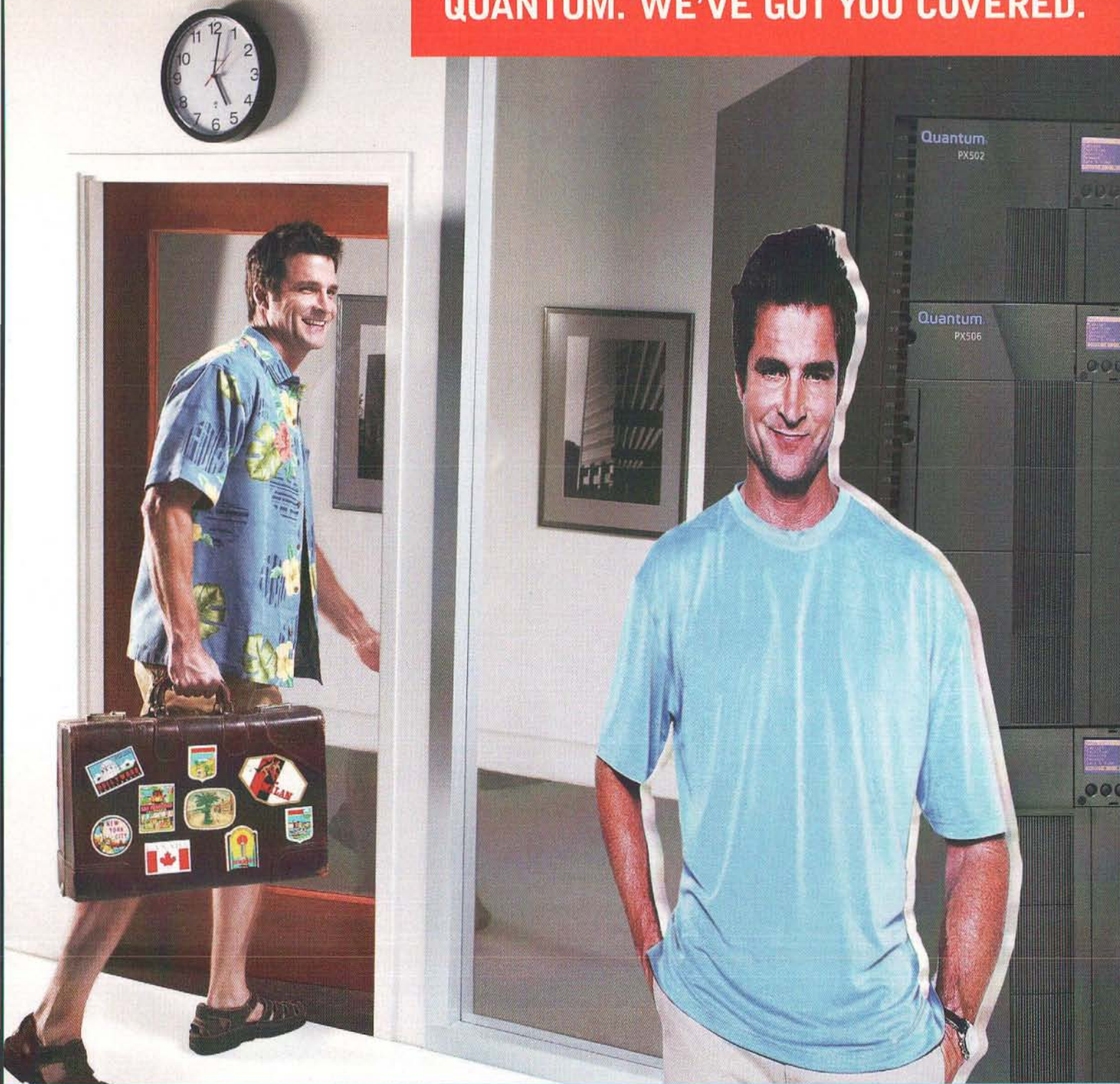
Wireless Performance Products for Mac by

QUICKERTEK

www.quickertek.com

GO!

QUANTUM. WE'VE GOT YOU COVERED.



The PX500 Series works weekends and holidays, so you don't have to.

With shrinking backup, recovery and archive windows, most IT Professionals protect their data after normal business hours and on weekends – the times when you would rather not sit around watching a tape library. Our PX500 Series redefines value in rackmount tape automation with enterprise-class features, high density and market-leading investment protection. And our superior performance, reliability and support allow you to have a normal life – with vacations. To find out how Quantum's got you covered with our new PX500 Series, call 866-827-1500 or visit us at www.quantum.com.

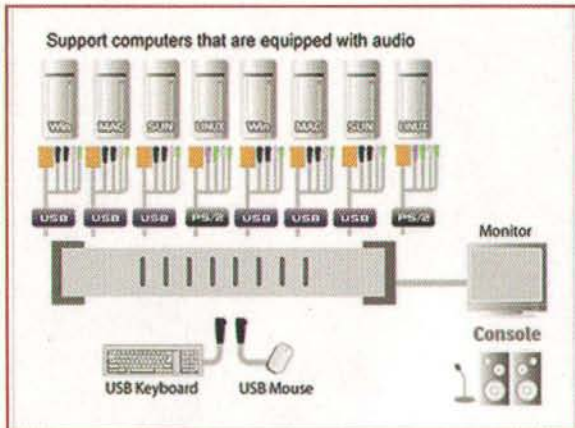
Quantum



BACKUP. RECOVERY. ARCHIVE. IT'S WHAT WE DO.™

©2006 Quantum is a trademark of Quantum Corporation in the United States and other countries. All other trademarks are the property of their respective companies.

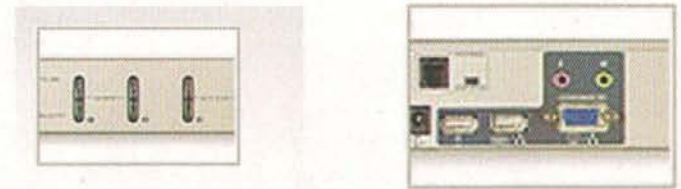
PCs, Sun Solaris systems, or Linux-based systems, by a single KVM switch. MasterView Max extends multi-platform support by supporting the special keys on both Mac and Sun keyboards.



MasterView Max also features Multimedia keyboard support (volume up/down, mute, and pulse), and audio that allows users to enjoy music while working. A single microphone can be used to provide input to all computers, and a single set of speakers can be used to listen to audio output of each computer.

MasterView Max features ATEN VSE technology, which provides video resolution of up to 2048 x 1536. The built-in AutoScan mode lets users monitor every attached computer at regular intervals of time. While AutoScan mode is active, ordinary keyboard and mouse functions are suspended - only

AutoScan compliant keystrokes, and mouse clicks can be input. User must exit Auto Scan mode in order to regain normal control of the console.



MasterView Max provides three ways to access computers connected with it:

- 1) Push button port selection switches located on front panel of the unit.
- 2) Entering keyboard Hotkey combinations.
- 3) Selecting from menus provided by the OSD.

Hotkey port control function allows control and configuration of switch from the keyboard. All hotkey operations begin by invoking Hotkey Mode. An alternate set of Hotkey Invocation keys is provided, in case the default set conflicts with programs running on the computers.

On Screen Display (OSD) functions, allow assigning of a unique name to each computer and accessing it via a menu-driven interface. OSD can also be used to rapidly switch to any port; scan selected ports only, designate a port as a Quick View Port, create or edit a port name, or make OSD setting



The #1 Open Source Database Management Tool in Town — Navicat for MySQL & PostgreSQL

To receive a 20% discount submit this code: Mlecho6 at <http://www.navicat.com/mactech.html>

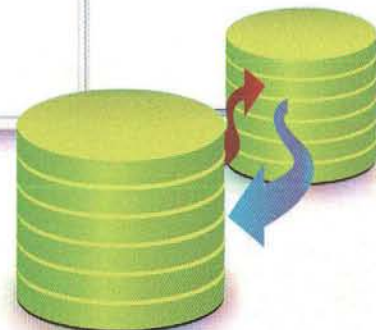
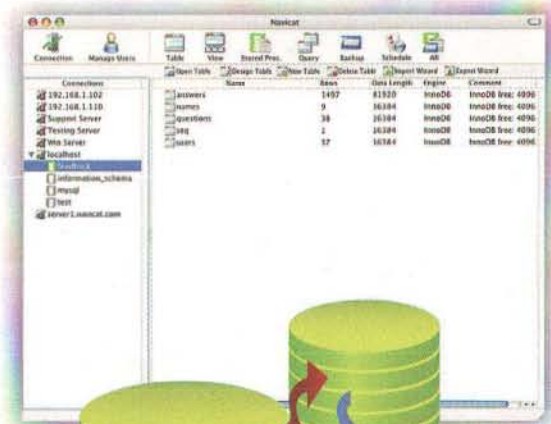
Navicat is the industry leading GUI Client for the most popular open source databases. The Cross Platform capability and Ease of Use of Navicat give you the flexibility and convenience to manage and develop your database. Navicat allows database developers/ administrators to be more productive by providing an intuitive graphical user interface to MySQL and PostgreSQL.

With Navicat, you can use a single, Industry's best-selling tool for both development and database object management on: Windows, Mac OS X and Linux. Managing multiple databases on your local/ remote server is easier than ever!

Navicat Migration Tool lets you import MS Access, Excel and other most popular file formats to the database. Other utilitarian tools such as Data Transfer, Data Synchronization, Backup and Report will empower you to work more efficiently.

With Navicat Batch Job Scheduling feature, you can sit back and let Navicat do the rest for you!

Find out more, and join our 1,100,000+ users at: www.navicat.com.



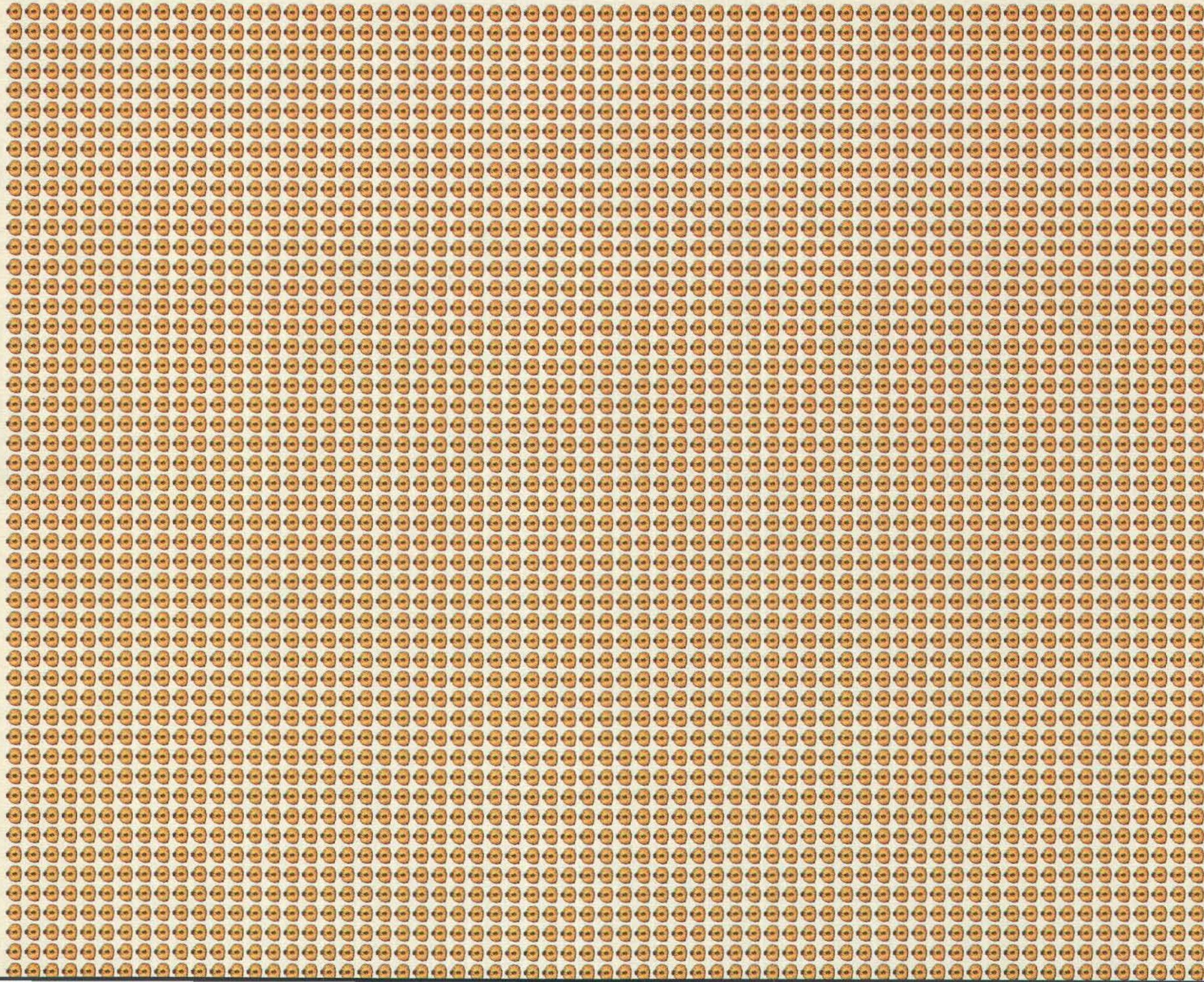
Universal

THE NATIONAL DEBT

COMPRESSED BY

STUFFIT DELUXE

SOFTWARE FOR MAC/PC



MACTECH[®]

domains

Register

**Get your .COM
or any other
domain name
here!**

FREE with every domain:

- **FREE! Starter Web Page**
- **FREE! Getting Started Guide**
- **FREE! Complete Email**
- **FREE! Change of Registration**
- **FREE! Parked Page w/ Domain**
- **FREE! Domain Name Locking**
- **FREE! Status Alert**
- **FREE! Total DNS Control**

Just visit

www.mactechdomains.com

to register for your domain today!

**Starting
at
\$1.99**

**when a non-domain name product
is purchased. Limitations apply.**

adjustments. OSD incorporates a two-level (Administrator/User) authorization system. Before the OSD Main Screen comes up, a dialog box appears that asks users to provide Username and Password. If the Password Function has been set, the user must provide them in order to access the OSD Main Screen.

Physical Case

MasterView Max is designed for both desktop and rack mounting, and it comes with 1U, 19-inch rack-mountable casing and status-monitoring port LEDs. 8 orange LEDs indicate that the computer attached to the corresponding port is online, whereas 8 green LEDs indicate that the computer attached to the corresponding port, is the one that has the switch focus. A separate power LED, lights up to indicate that switch is receiving power.

MasterView Max employs USB keyboard and mouse for the console, but the dual interface support allows users to connect both PS/2 and USB computers, on the same switch, with the option of connecting the switch to computer with PS/2 connectors, or USB connectors, depending on the cable used to link the switch to the computers. Dual interface support is available for PC compatible systems only. MasterView Max is compatible with Mac OS8.6 or higher, Windows 98SE / ME / 2000 / XP, and Solaris.

Setting up MasterView Max is easy, as it requires plugging cables into their appropriate ports, with no software to be configured and no installation routines to be executed. MasterView Max is hot pluggable and it detects device change, allowing adding or removing computers for maintenance, without powering down the switch. MasterView Max is firmware upgradeable through flash ROM, and it supports complete keyboard emulation for error-free booting. Firmware upgrade is achieved by using a Windows-based Firmware Upgrade Utility (FWUpgrade.exe). We have not seen a need yet to do this, so not having Mac support here was not a big issue.

MasterView Max supports CPU connectors including 8 SPDB15 Female for keyboard, mouse, and video, and 8 microphone and stereo ports for audio. MasterView Max has operating temperature range of 0 to 50 degrees C, operating humidity range of 0 to 80 percent RH, storage temperature range of minus 20 to 60 degrees C, and power rating of DC 5V, 3.4W, 2.6A.

MasterView Max package comprises of 1 8-port KVM switch, 1 power adapter, 1 rack mount kit, 1 firmware upgrade cable (RJ-11 socket), user manual, and quick start guide.

For more information visit:

<http://www.aten-usa.com/>

Current Retail Price:

\$499.95

Ma

- by MacTech Staff

Expand your possibilities...

www.MacSales.com

Cinema Display not included.



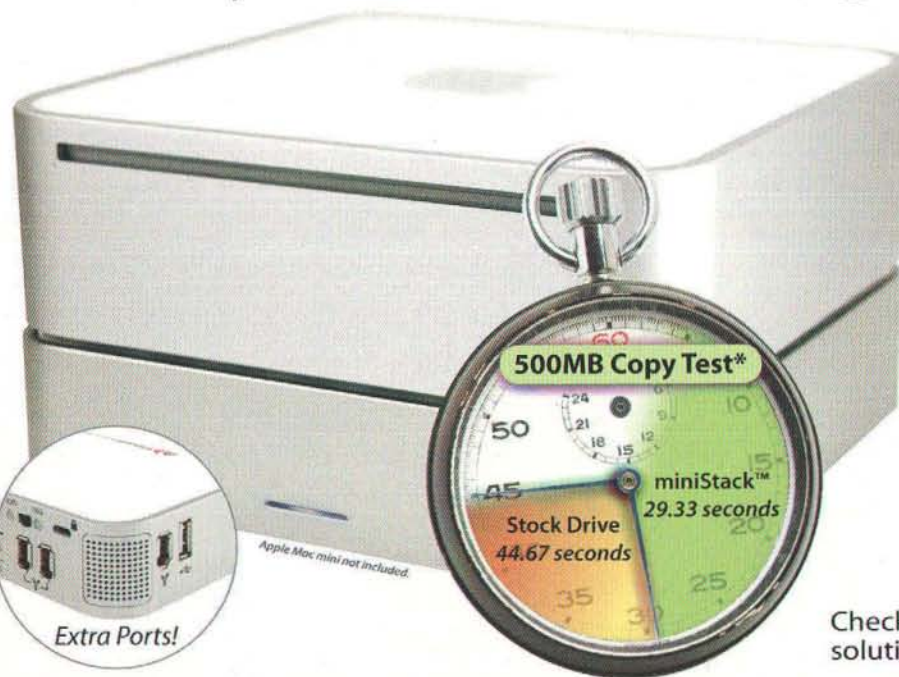
New for
2006



newer technology

miniStack™ V2

More Speed... More Storage... More Ports...



Own the Future today!
macsales.com/storage

The NewerTech **miniStack™ V2** now
with both rear and side FireWire
and USB Hub ports.

Audio/Video, Backup, Bootable
Data Storage, Music, Graphics,
Performance RAID, & More!

Storage Capacities from 80GB to
500GB, *the perfect fit is a mouse
click away.*



Check out our full line of external storage
solutions plus much more at macsales.com



Other World Computing

Serving the Computer Universe since 1988

Visit macsales.com/storage 800.275.4576

MT_06_06 Other World Computing, Newer Technology, a part of New Concepts Development Corp., 1004 Courtaulds Dr., Woodstock, IL 60098

Prices, specifications, and availability are subject to change without notice. Items returned within 30 days may be subject to a restocking fee. No return will be accepted without Return Merchandise Authorization number.



AN INTRODUCTION TO SCRIPTING FETCH

For the past several months, we have discussed ways to store and access data from AppleScript. We have talked about script properties, property list files, scriptable database applications, and more. In this month's column, I'd like to switch gears, and talk about a great application that I have been scripting quite a lot lately. That application is Fetch.

Fetch is a popular FTP/SFTP client for the Macintosh. It is a commercial application, and a demonstration version is available for download from the Fetch Softworks website at <http://www.fetchsoftworks.com>. If you do not own a license for Fetch, then I encourage you to download a demonstration version, so that you may follow along with the various example scripts throughout this month's column.



Figure 1. Fetch's Well-Known Icon

All of the example code that we will discuss was written and tested with Fetch version 5.1b2. As when scripting any application, if you are using an older or newer version of Fetch, then you may notice some differences in the AppleScript terminology. If this occurs, please refer to Fetch's AppleScript dictionary for guidance in determining the proper syntax to use.

Connecting to a Server

The first thing that we are going to discuss, is the process of connecting to a remote server. For my testing, I

enabled incoming FTP access in the *Sharing* system preference on another Mac OS X computer, on my local network. However, I could have just as easily chosen to access a remote server, such as the one hosting my website, or one of a client. For your testing, if you have a second machine running Mac OS X, then you can enable incoming FTP access (you'll probably want to ensure that your network is secure, or enable a firewall prior to doing this) for testing. Otherwise, you will need to find a server that you can access remotely via FTP or SFTP.

Making a new server connection in Fetch, is done by creating a new window, called a transfer window. See figure 2.

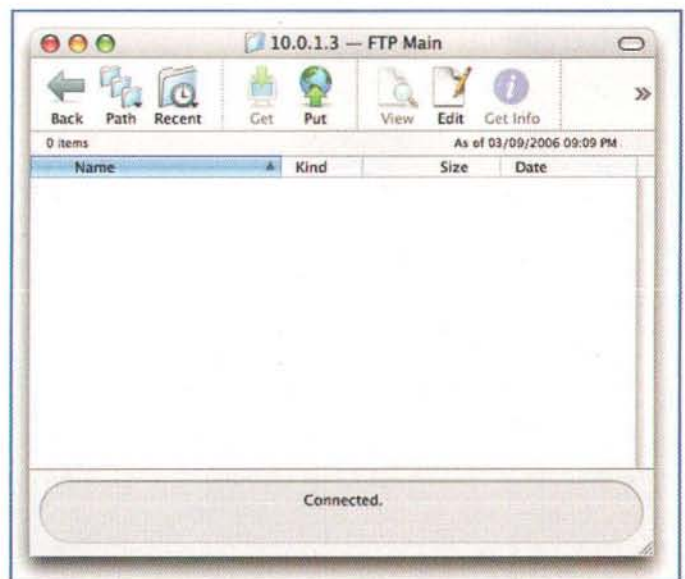


Figure 2. A Transfer Window Connection

Creating a transfer window is done with the use of the make command, as demonstrated in the example code below. You will want to replace my example IP address, username, password, and initial directory with ones that are relevant to the server to which you are attempting to connect.

```
set theServerAddress to "10.0.1.3"
set theUserName to "myUserName"
set thePassword to "myPassword"
set theDirectory to "Documents/FTP Main/"

tell application "Fetch"
    make new transfer window at beginning with properties
    {hostname:theServerAddress, username:theUserName,
    password:thePassword, initial folder:theDirectory}
end tell
-> transfer window id 120663408 of application "Fetch"
```

As you can see from the code above, the result of making a new transfer window is a reference to the newly created window. Notice that the window is referenced by its ID. As you navigate to different folders on the remote server, the transfer window's name will change. Therefore, to refer to the newly created transfer window again later in your code, you may want to capture this result in a variable. For example:

```
tell application "Fetch"
    set theTransferWindow to make new transfer window at
    beginning with properties {hostname:theServerAddress,
    username:theUserName, password:thePassword, initial
    folder:theDirectory}
end tell
```

When a transfer window is made, its default authentication type is FTP. However, you may explicitly specify that a different type of authentication be used, such as SFTP. This can be done by specifying a value for the transfer window's authentication property, when the transfer window is created, as the following code demonstrates.

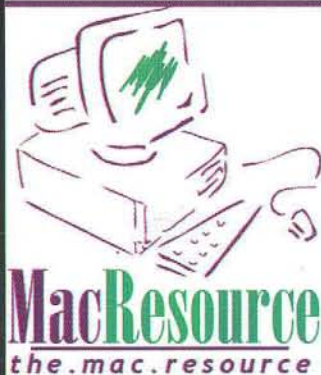
```
tell application "Fetch"
    make new transfer window at beginning with properties
    {hostname:theServerAddress, username:theUserName,
    password:thePassword, initial folder:theDirectory,
    authentication:SFTP}
end tell
```

As previously mentioned, one way to refer to a transfer window in the future is to do so by setting a variable to the result when making a transfer window. This variable would include a reference to the transfer window using a unique ID. If you are working with an existing transfer window, you can find out its unique ID with the use of the following code:

```
tell application "Fetch"
    id of front transfer window
end tell
-> 120663408
```

Once you have a window's ID, you can refer to it later by that ID. For example:

```
tell transfer window id 96356736
    - Add Code Here
end tell
```



Wireless Products

Airport Cards
Extreme: \$69.99
Standard: \$139.99
Routers: \$59.99



Accessories

Apple Mice: \$19/\$69
Apple Kbd's: \$19/\$49
Kensington 4-b'tn
Mice: \$19



Parts for Every Mac System!

Logic Boards

G3 B&W/G4 PCI : \$129
G4 AGP Graphics: \$179
G4 Gigabit: \$199
G4 Digital Audio: \$239
G4 Quicksilver: \$449
G4 Mirrored Drive Doors: \$489
G3 iMac Logics From \$69
G4 iMac Logics From: \$199
G5 Towers and Xserve SCALL



Power Supplies

G4 iMac 15/17/20: \$79/\$99/\$119
G5 iMac 17/20: \$149/\$179
G5 Tower: \$169/\$199
G4 Quicksilver: \$179
G4 Digital Audio: \$189
G4 Gigabit Ethernet: \$199
G4 AGP Series 237w: \$219
G4 AGP Series 208w: \$179
G4 Mirrored Drive Doors: \$199



Logic board and power supplies require exchange

Thousands of parts
in stock for all
Mac systems!

www.mac-resource.com

Mac Systems

G4/867Mhz: \$699
G4/933Mhz: \$899
G4/1.25 OS9: Call



New Systems
Arriving Daily!
Call for latest
Stock.

XSERVES AND RAIDS BEST PRICES!!!!

G4 XSERVES STARTING@ \$999!!!!
G5 XSERVES STARTING @\$1499!!!!
1 TB XSERVE RAIDS FROM \$3499!!!!
2.8 TB XSERVE RAIDS FROM \$4499!!!!
5.6 TB XSERVE RAIDS FROM \$6999!!!!
RAID CARDS, FIBRE CARDS, DRIVE MODULES
SERVICE KITS, CONTROLLER MODULES ETC!!!!

eMac 800Mhz: \$449, eMac 1GHz: \$549
iMac G4/700 15": \$449 G4/1.25Ghz 17": \$749

iBook G3/800 Combo 12": \$499
iBook Stock Arriving Daily!



Displays

Apple 17" Studio LCD: \$349

Apple 23" Cinema: \$899
Apple 22" Cinema: \$799



Apple 15-inch Studio LCD: \$179
Apple 17" Studio CRT, ADC or VGA: \$69.99

You may also have the need to retrieve the name of a transfer window. However, as mentioned before, the name of the transfer window will change if you open a remote folder.

```
tell application "Fetch"
    name of transfer window 1
end tell
-> "10.0.1.3 - FTP Main"
```

You can also refer to a transfer window by its index, or front to back order. For example, the following code would target the frontmost transfer window, which has an index of 1.

```
tell transfer window 1
    - Add Code Here
end tell
```

Throughout this column, all of my example code will target a transfer window by its index.

Working with Remote Items (Part 1)

Now that we have discussed connecting to a server, let's begin to look at ways to interact with the remote items on that server. First, let's turn to remote folders.

Suppose you want to create a remote folder on the server. First, you will probably want to determine if the folder already exists. To do this, use the `exists` command. For example:

```
tell application "Fetch"
    tell transfer window 1
        remote folder "Job 1000" exists
    end tell
end tell
-> false
```

If the remote folder did not exist, then you can choose to create it. Like creating a server connection, you will use the `make` command to create a folder. The following example code demonstrates the proper syntax for performing this task. Figure 3 shows an example of a newly created remote folder.

```
tell application "Fetch"
    make remote folder at transfer window 1 with properties
        (name:"Job 1000")
    end tell
```



Figure 3. A Newly Created Remote Folder

Now that you have a remote folder, you may want to open it. To do this, use the `open` command, as demonstrated by the following code.

```
tell application "Fetch"
    tell transfer window 1
```

```
        open remote folder "Job 1000"
    end tell
end tell
```

Note that, after opening a folder, the name of the transfer window will be changed to reflect the currently opened folder. An example of this can be seen in figure 4.

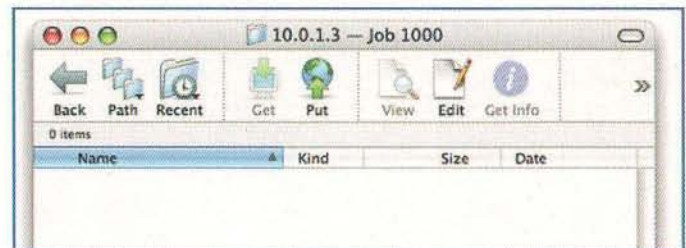


Figure 4. An Opened Remote Folder

Uploading

We will return to interacting with remote items shortly. For now, we will discuss uploading items to the server.

To upload an item to a remote directory, you will make use of Fetch's `put into` command. The following example code demonstrates the proper use of this terminology. First, it will prompt the user to select a file. It will then upload that file to the currently opened remote folder on the server. Figure 5 shows an example of an uploaded item.

```
set thePath to choose file with prompt "Please select an
item to upload:" without invisibles
tell application "Fetch"
    with timeout of 300 seconds
        put into transfer window 1 item thePath
    end timeout
end tell
```



Figure 5. An Uploaded Item

The `put into` command's only required parameter is the `item` parameter, which we have utilized in the previous code to indicate the path of the desired file to be uploaded. The `put into` command also offers the ability to specify a number of optional parameters, which can affect how the item is uploaded. For example, you might specify the `resume` parameter if you want to resume a previous upload. Or, you might specify the `uniquename` parameter, if you want Fetch to automatically assign a unique name to the item if an item with the same name that already exists. For a complete list of the `put into` command's optional parameters, please refer to Fetch's AppleScript dictionary.



Our headsets brought the world closer to the moon.
Now they can keep you close to your music.



PULSAR™ 590A
ULTIMATE STEREO BLUETOOTH® HEADSET

MUSIC AND MOBILE - Listen to music or movies, and answer phone calls.

TALK AND LISTEN LONGER - Up to 12 hours talk time and 10 hours stereo listening.

UNIVERSAL ADAPTABILITY - Enjoy Bluetooth functionality with most devices.

In 1969, a Plantronics headset carried those first words from the moon, "That's one small step for man..." Our latest Bluetooth headset, the Plantronics Pulsar 590A, was designed for versatility here on Earth. Seamlessly switch between your Bluetooth phone and your favorite music, so you'll never miss a call. And with the Universal Adapter, you can experience Bluetooth stereo listening on most laptops, Macs, TVs, DVD players and MP3 players. So your next mission will be as enjoyable as ever.

We've been to space, now it's your turn. Enter to Win a Trip to Space—visit Plantronics.com or text "headset" to SPACE (77223).



PLANTRONICS.
SOUND INNOVATION™



NO PURCHASE NECESSARY TO ENTER OR WIN IN THE PLANTRONICS TO SPACE AND BEYOND PROMOTION. Must be 18 or older and a legal resident of the 50 U.S. or D.C. Game begins 1/10/06 at 9:00:01 AM CT and ends 12/31/06 at 5:00:01 PM CT. Void where prohibited. Subject to the Official Rules, available at www.plantronics.com. See Official Rules for how to enter and complete prize details. ©2006 Plantronics, Inc. All rights reserved. Plantronics, the logo design, Plantronics Sound Innovation and Pulsar are trademarks or registered trademarks of Plantronics, Inc. The Bluetooth name and the Bluetooth trademarks are owned by Bluetooth SIG, Inc. and are used by Plantronics, Inc. under license. All other trademarks are the property of their respective owners. Space photo imagery courtesy of NASA.

Working with Remote Items (Part 2)

Whether or not you have uploaded items to the server yourself, there will probably be times when you will want, or need, to interact with remote items on a server. See figure 6.

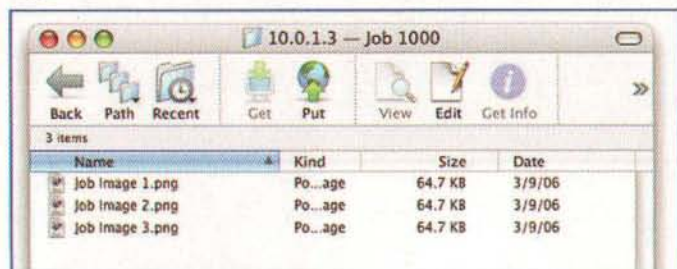


Figure 6. A Folder of Remote Items

We have already discussed how to navigate folders on a server. Now, let's talk about how to get the contents of a folder. The following example code will retrieve the names of every remote item in the currently opened folder.

```
tell application "Fetch"
  tell transfer window 1
    name of every remote item
  end tell
end tell
-> ["Job Image 1.png", "Job Image 2.png", "Job Image 3.png"]
```

NOTE: In the previous code, we referenced every remote item. A remote item can be either a file or a folder on the server. To target one or the other specifically, use either remote file or remote folder instead.

You can also retrieve numerous properties of remote items on a server, such as the remote item's path, modification date, permissions, and more. The following example code demonstrates how to retrieve the size of a remote item, in bytes.

```
tell application "Fetch"
  tell transfer window 1
    size of remote item "Job Image 1.png"
  end tell
end tell
-> 66242
```

As you work with remote items, you may also have the need to delete a remote item. This can be done by using the delete command. For example:

```
tell application "Fetch"
  tell transfer window 1
    delete remote item "Job Image 2.png"
  end tell
end tell
```

Downloading

We have covered uploading items to a server. Now, let's talk briefly about downloading items. To download an item, use the download command, and specify a folder into which the remote item should be downloaded. For example:

```
set theOutputFolder to path to desktop folder
tell application "Fetch"
  tell transfer window 1
    download remote item "Job Image 1.png" to theOutputFolder
  end tell
end tell
-> {file "Macintosh HD:Users:bwaldie:Desktop:Job Image 1.png"}
```

As you can see from the previous example code, the download command will result in a list of file references to the newly downloaded items.

Miscellaneous Tasks

When working with a transfer window, whether uploading, downloading, or otherwise, you may want to determine the status of the server connection. This can be done by accessing the transfer window's status property. For example:

```
tell application "Fetch"
  tell transfer window 1
    status
  end tell
end tell
-> "Connected."
```

The status property will return the text of the current status of the fetch window, as it appears visually at the bottom of the window itself. Other transfer window attributes, which can often be useful when scripting Fetch, are also accessible via properties. Such attributes include the elapsed transfer time, and the bytes transferred, of a current transfer.

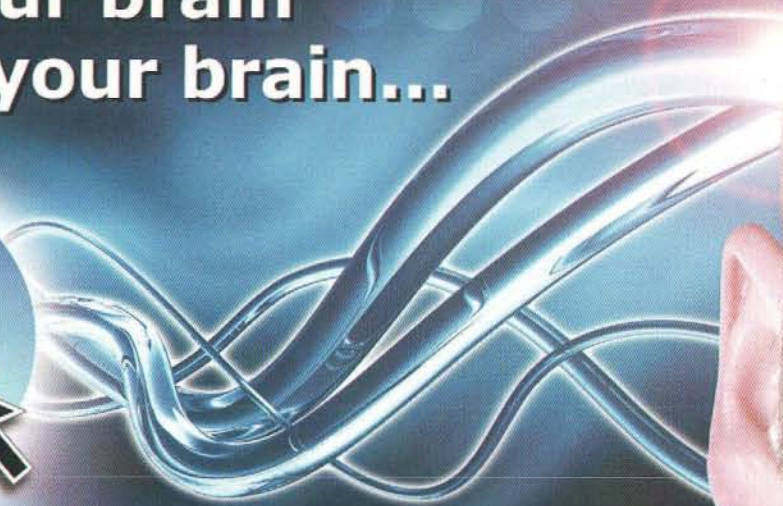
Once you have completed your Fetch scripting, you may want to have your script close down the server connection. This can be done by using the close command to close the transfer window. For example:

```
tell application "Fetch"
  close transfer window 1
end tell
```

Recording and Next Steps

Now that we have discussed various ways to interact with Fetch via AppleScript, I should also mention that Fetch is one of those rare applications

From our brain
to your brain...

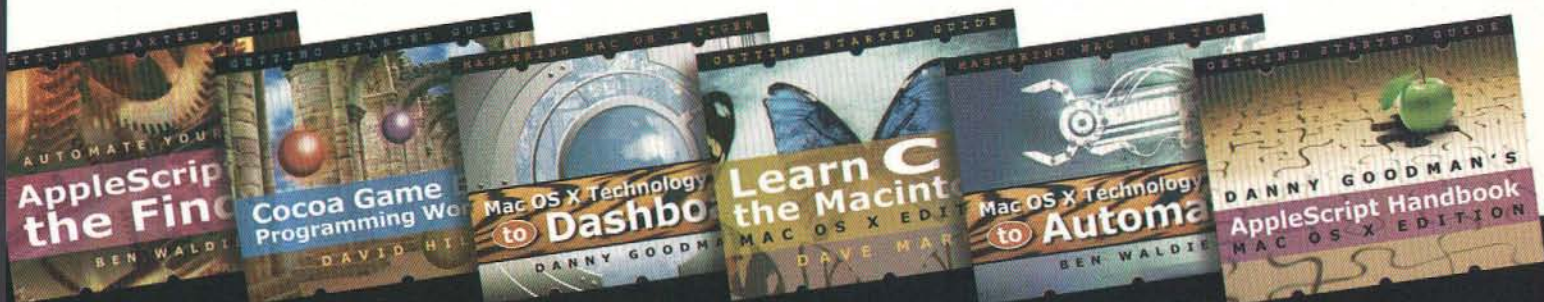


NEW!



SpiderWorks Books

Timely, quality content from respected authors at a great price. Available in softcover print editions and eBooks.



Download **FREE** Previews at SpiderWorks.com

that supports recording! That is, you can click the *Record* button in a Script Editor window, perform tasks manually in Fetch, and those tasks will be translated into AppleScript code, and written for you automatically in the Script Editor window. See figure 7 for an example of a recorded Fetch script.

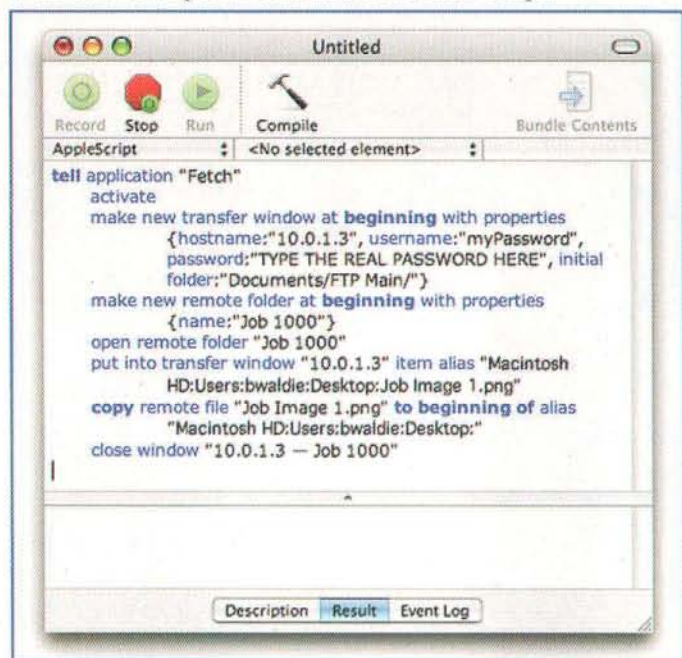


Figure 7. Recording Manual Fetch Activity

You may be asking "Why didn't he mention that Fetch was recordable in the first place?" Well, one reason

I didn't mention this is because I wanted to show how easy it is to begin scripting Fetch without recording. Another reason is that there are limitations to recording AppleScript code in any application. A recorded script does not include variables, if/then statements, or repeat loops. Because of this, recorded scripts are typically not as efficient as scripts written from scratch. Recorded



Figure 8. Fetch Example Scripts

scripts also perform tasks exactly as you recorded them, and do not have the ability to analyze situations and take different courses of action. However, recording is still a

Is your computer running slow?

Maybe it needs a boost.

Make your life a little faster and easier,
get better RAM.

betterRAM.comsm

Name brand quality. Value pricing. Lifetime guarantee. World class support.

Toll Free: (800) 895-3493 • Outside US/Canada: 805-494-9797 • Fax: 805-494-9798

www.betterram.com



PHONEPIPETM VOIP Service

Residential Plans

The PhonePipe 500

\$14.99

500 Minutes - US and Canada

*Additional Minutes 3.5 cents

The PhonePipe 900

\$19.99

900 Minutes-US, Canada, Austria, Belgium, Chile, China, Denmark, France, Germany, Hong Kong, Ireland, Italy, Malaysia, Netherlands, New Zealand, Norway, Singapore, South Korea, Spain, Sweden, Switzerland, Taiwan, UK

*Additional Minutes 3.5 cents

The PhonePipe Unlimited

\$24.99

**Unlimited Minutes
US and Canada**

The PhonePipe Unlimited International

\$34.99

Unlimited Minutes-US, Canada, Austria, Belgium, Chile, China, Denmark, France, Germany, Hong Kong, Ireland, Italy, Malaysia, Netherlands, New Zealand, Norway, Singapore, South Korea, Spain, Sweden, Switzerland, Taiwan, UK

*All Plans Include Caller ID, Voicemail, and Three-Way Calling

Business Plans

Base Line

Starting at

\$20.00 a Month

Includes:

- VM • CallerID
- 3-Way Calling
- Call Forwarding
- Call Waiting Plus

*Long Distance Starting at
2 Cents Per Minute

Enhanced Line

Starting at

\$30.00 a Line

Includes:

- Basic Line Features
- Microsoft Outlook Integration
- Find Me-Follow Me
- Simultaneous Ring
- Personal Web Portal

*Long Distance Starting at
2 Cents Per Minute

Unlimited Line

\$49.99 a Line

Includes:

- Enhanced Line Features
- Unlimited Long Distance
to US and Canada

*Long Distance Starting at
2 Cents Per Minute

*All Business Lines Include PBX Features: Call Transfer, Music on Hold (Customizable), Call Hold, 4 or 5 Digit Dialing

Optional Features: Auto Attendant, Call Center, Reception Console

www.PhonePipe.com
1-877-300-3035 Ext 8200

good way to get started, and it can often be helpful in determining the proper syntax for performing that certain task when you just can't figure it out on your own. Furthermore, you always have the ability to go back and edit your recorded scripts, to make them more efficient, or to add logic to them.

If you plan to begin scripting Fetch, another good place to start is to download the example scripts that are available from the Fetch Softworks website at <http://fetchsoftworks.com/downloads.html>. These example scripts will provide you with unlocked, editable sample code for performing tasks such as connecting to servers, uploading items, and more. See figure 8.

In Closing

Although this month's column focused specifically on using Fetch as a scriptable FTP/SFTP client, please be aware that it is not your only choice. There are other applications and tools that are used by AppleScript developers for transferring files across networks.

Transmit, available from Panic Software at <http://www.panic.com>, and Cyberduck, available at <http://www.cyberduck.ch> are two other popular FTP/SFTP clients for Macintosh, and are frequently utilized by scripters. URL Access Scripting, which is built into Mac

OS X, can be used for performing uploads and downloads to remote servers. URL Access Scripting can be found in the *System > Library > ScriptingAdditions* folder in Mac OS X. Many AppleScript developers also choose to utilize the power of UNIX for performing network file transfers. The `do shell script` AppleScript command in Mac OS X can be used in conjunction with UNIX tools such as `curl` or `ftp` to perform such tasks.

Until next time, keep scripting!

MI

About The Author



Ben Waldie is the author of the best selling books "AppleScripting the Finder" and the "Mac OS X Technology Guide to Automator", available from <http://www.spiderworks.com>. Ben is also president of Automated Workflows, LLC, a company specializing in AppleScript, and workflow automation consulting. For years, Ben has developed professional AppleScript-based solutions for businesses including Adobe, Apple, NASA, PC World, and TV Guide. For more information about Ben, please visit <http://www.automatedworkflows.com>, or email Ben at applescriptguru@mac.com.

BMS

**THE LAW OFFICE OF
BRADLEY M. SNIDERMAN**

Need help safeguarding your software?

**If you're developing software, you need your valuable work protected with
trademark and copyright registration, as well as
Non Disclosure Agreements.**

**Then, when you are ready to sell it, you can protect yourself further
with a licensing agreement.**

**I am an attorney practicing in Intellectual Property, Business Formations,
Corporate, Commercial and Contract law.**

Please give me a call or an e-mail. Reasonable fees.

23679 Calabasas Rd. #558 • Calabasas, CA 91302
PHONE 818-706-0631 FAX 818-706-0651 EMAIL brad@sniderman.com

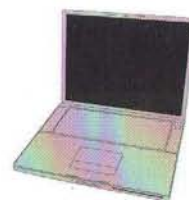
The iPod Showcase/Marketplace



Protection Pack

Now Available for MacBook™ Pro

Includes:
Keyboard cover
Hand rest



Keyboard cover

- Protects screen
- Doubles as screen cleaner

Hand rest

- Protects your notebook while typing
- Easy to remove and reapply

You didn't compromise on your notebook—
don't compromise on its protection.

www.MARWARE.com

Be the one with all the answers.



MacTech is already read every month by tens of thousands of readers. MacTech readers represent the very heart and soul of the the Mac community. Join the crowd and sign up for MacTech today!

store.mactech.com/riskfree

What's the *difference*?

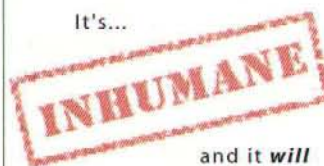


Brand new. It's perfect.
It's beautiful...

and it's **vulnerable**!

It's naked, exposed to
the elements.

It's...



and it **will**
get scratched.



Brand new. It's perfect.
It's beautiful...

and it's **protected**!

Invisible, durable, &
rugged protection.

SAVE the iPod

www.theinvisibleSHIELD.com



Other World Computing

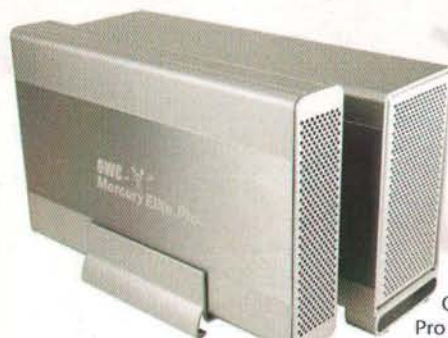
Serving the Mac Universe since 1988

www.macsales.com • 800.275.4576

Highly Reliable, High-Performance, Plug & Play - FireWire & USB2 External Storage Solutions from \$99.95

Add up to 1 Terabyte - 1000GB - for you Data, Graphics, Audio/Visual, Music, and Storage Needs with a top rated Mercury™, Neptune™, or NewerTech™ Storage Solution from OWC.

- Latest Oxford Chipsets • Top Hitachi and Seagate Drives
- EMC Retrospect Backup Certified
- 2 Year Warranty



The ONLY Pocket-Sized Solution up to 160GB!

Own the Future TODAY!

www.MacSales.com/firewire

LAYERS
5 LAYERS OF PROTECTION

MacAddict RATED
GREAT

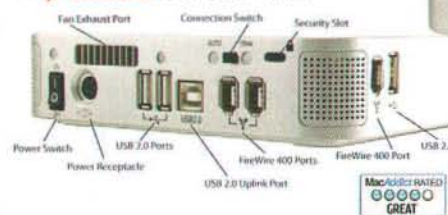
EDITORS' MacAddict CHOICE
Macworld

OWC Mercury Elite-AL Pro up to 500GB & OWC Mercury Elite-AL 800 Pro RAID 80GB to 1TB(1000GB) from \$119.99

See the full line of OWC FireWire solutions, as well as solutions by LaCie, EZ Quest, SmartDisk, and Webtech online at macsales.com/FireWire

NewerTech miniStack™ V2 FireWire+USB2 Solutions with integrated FireWire and USB2 Hubs bring high performance storage and port convenience with solutions 80GB to 500GB from \$129.00

miniStack™ V2



Macworld Magazine
December 2005
'Top Product'

MacAddict RATED
GREAT

Macworld

EDITORS' MacAddict CHOICE

Mac Improvement NuPower™ Laptop Batteries

Batteries that Run Longer and Last Longer! Built in the USA and built right for up to 55% more runtime vs. your original Apple stock battery!

PowerBook G4 Ti from \$129.99
PowerBook G4 AL 12/15/17" from \$129.99
iBook G3/G4 from \$109.99

Call or Visit macsales.com/NewerTech

Laptop Screen Protectors

Protect your screen! There's an OWC Laptop Screen Protector (LSP) product for your Mac.

PowerBook G4 17" \$17.99; PowerBook G4 15" \$17.95
PowerBook G3 15" \$14.99; iBook/PowerBook G4 12" \$13.95

The OWC LSPs are precision cut, glove soft leather protectors that prevent potentially permanent marks which can occur from the trackpad and keyboard while your laptop is closed.



Network Adapters

Sonnet

Sonnet Presto 10/100/1000 Gigabit Ethernet PCI \$85.99

PRAM Batteries

Is your Mac forgetting what time it is? OWC PRAM batteries starting at \$4.99

Wireless Mouse

Logitech Cordless 'Click' Optical Mouse for USB SPECIAL \$15.99

The Latest Enhancements

Rain Design i360™

A Turntable for your iMac G5 17" and 20" \$39.00

Village Tronic VTBook

Add another CRT or Flat Panel Display to your Powerbook \$246.99

iLugger iMac cases

for the iMac G5 or for Mac mini and/or up to 20" LCD Display 5 color combinations starting at \$99.99



Eye candies for your iMac. Six to choose from.



Maximize your Mac

www.MacSales.com

SuperDrive Your Mac From Only \$52.99!

Make Music, Movies & More! Add a Fast SuperDrive to your Mac to Burn CDs, DVDs, even 8.5GB Dual Layer DVDs.



Not sure what upgrade is best for your computer?

Visit:
macsales.com/MyOWC
A custom shopping experience to make your Mac a better Mac.

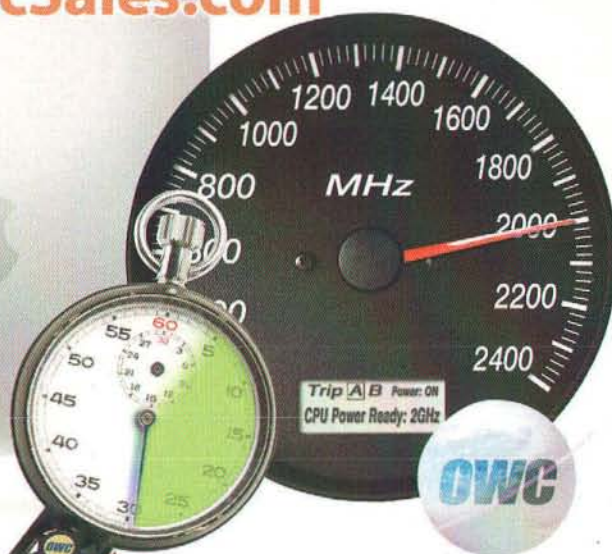
Speed it up as high as G4/2.0GHz or Dual 1.8GHz!

OWC Stocks the full line of G3 & G4 Processor-upgrades by these leading manufacturers:



G4 Single Upgrades from \$159.00; G4/1.6GHz only \$239.00
G4 Dual/1.6GHz from \$449.00; Dual 1.8GHz from \$595.00

G4 Upgrades for PowerMac G3s, PowerMac G4s, Cube G4, PowerBook G3s - Even Legacy PowerMac 7200-9600 Models!



30 Day Money-Back
on NewerTech and OWC brand upgrades!



Give us a call or check out our website. Our compatibility guide will show just what options are right to make your Power Mac, PowerBook, iMac, etc - a Faster Mac today! Call 800.275.4576 Visit macsales.com/faster

Upgrade Your Memory & Save

Make your computer faster for less with Other World Computing. Memory is the most inexpensive way to maximize your Mac. From min to the Max - OWC has the right Memory for your Apple.

For NEW 2006 MacBook Pro, iMac, & Mac mini Intel models:

PC5300 DDR2 667MHz 200 Pin
512MB Modules only \$59.99
1.0GB Modules only \$119.99
2.0GB Set only \$239.00

For PowerBook 12/15/17; iBook G3/G4s:

512MB Modules from \$49.00
1GB Modules from \$115.99
2GB Sets from \$229.00

Lifetime Advance Replacement Warranty.



For PowerMac G5 and iMac G5 Models:
512MB DIMM from \$42.99
1.0GB DIMM from \$87.99
1.0GB Pair (512x2) from \$83.99
2.0GB Pair (1GBx2) from \$175.00
2.0GB DIMM from \$239.00
4.0GB Pair (2GBx2) from \$459.00

For PowerMac G4, iMac G4, eMac G4, Mac mini:
256MB from \$25.00
512MB from \$49.00
1GB from \$89.99

Hard Drives

Bulk up your computer by giving it higher capacity to perform for your needs.

Hard Drive Controllers

Hard Disk Controller Cards

ACARD
Acad 2-Channel PCI SATA \$59.99

STC
Serial ATA 4-Channel PCI-M \$79.95

SONNET
Tempo ATA & SATA Mac PCI Controllers

Tempo Trio FireWire/USB2/ATA-133 all in one PCI \$149.00

FirmTek
4-Channel SATA Controllers from \$119.95

SATA Internal Mounting System

SONNET
Sonnet G5 Jive, add 3 SATA HDs to PowerMac G5 \$95.00

SATA Internal Mounting System

SONNET
Sonnet G5 Jive, add 3 SATA HDs to PowerMac G5 \$95.00

SATA Internal Mounting System

SONNET
Sonnet G5 Jive, add 3 SATA HDs to PowerMac G5 \$95.00

SATA Internal Mounting System

SONNET
Sonnet G5 Jive, add 3 SATA HDs to PowerMac G5 \$95.00

Internal Hard Drives

For iMacs, eMacs & PowerMacs

3.5" Plug & Play 40GB to 500GB from \$47.99

250GB Super Value \$99.95

For PowerBooks, iBooks & Mac mini

2.5" 40GB to 160GB from \$77.99

100GB 7200RPM NoteBook Performance \$219.99

SATA Enclosures

OWC
OWC Mercury Elite SATA RAID Solutions Perfect for

Mass Storage or RAID. Cables included. 1 Year OWC

Warranty. Starting From \$79.95

FirmTek
Dual-Bay Hot Swap External Serial ATA Enclosure with

SATA PCI Controller Card \$257.95

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

Software

Apple OS X 'Tiger' \$99.00

full retail box version

OS X 10.2, 10.3 from \$17.99

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00



NEW!
iLife '06
\$79.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

iPod Replacement Batteries



iPod Replacement Battery Kits

Easy to Install, Tools Included + Online Installation

Videos. Get up to 78% more capacity & 20+ Hours Runtime!

NuPower™

iPod Batteries for nearly every Apple iPod

Starting From \$14.99

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

SONNET
Sonnet Fusion 4-Bay SATA Kit \$549.00

Not comfortable opening your iPod?
For \$39 + the cost of the battery, OWC installs it for you - iPod shipping Box and FedEx Overnight covered to and from! macsales.com/iPodinstall

OWC's full line of iPod Batteries, Accessories, and more online at macsales.com/iPod



FasterMac.net
Pay less. Get more. Surf faster!

Mac-Only Internet from only \$5 per month!

High-Speed Nationwide
Dial-up and DSL Services
Toll-Free Tech Support &
More from Mac Experts

Visit FasterMac.net or call toll free 800-869-9152 to learn more or to sign up.

Advertiser/Product Index

4D, Inc.	17
Absoft Corporation	29
Allume Systems, Inc.	BC
Allume Systems, Inc.	4
Allume Systems, Inc.	27
Allume Systems, Inc.	57
Aten Technology, Inc.	34
BetterRAM.com	66
Brad Sniderman	68
Brian Loomis	31
CRYPTOCARD Corporation	16
Daystar Technology	IBC
Equilibrium	20
GLUON/CaptureWorks	12
IGC, Inc. / MaxEMail.com	43
Intego, Inc.	9
Intel Corporation	23
JCHS Media Pte Ltd. / Mobile Juice	36
Kerio Technologies Inc.	46
LTA Projects	11
MacForge.net	33
MacResource Computers & Service	61
MacSpeech, Inc.	42
MacTech Domains	58
MacTech Magazine	45
MARWARE, Inc.	69
Meta Communications	25
MOST Training and Consulting	47
MYOB US, Inc.	37
Netopia, Inc.	19
Now Software	21
OlympicControls Corp.	41
OmniPilot Software, Inc.	IFC
Other World Computing	35, 59, 70-71
Ovolab	2
Peachpit Press	53
Plantronics	63
PremiumSoft CyberTech Ltd.	56
Protective Solutions Inc.	69
Quantum Corporation	55
QuickerTek	54
RadTech, LLC	13
Seapine Software, Inc.	49
Spiderworks	65
SubRosaSoft.com, Ltd.	1
Tellurium Communications, Inc.	67
Utilities4Less.com	39
Windows IT Pro	51

Absoft Compilers • Absoft Corporation	29
Accelerators/Upgrades • Daystar Technology	IBC
AccountEdge • MYOB US, Inc.	37
Bags • LTA Projects	11
BookEndz • OlympicControls Corp.	41
CaptureWorks • GLUON/CaptureWorks	12
CopyCatX/FileSalvage • SubRosaSoft.com, Ltd.	1
CRYPTO-Server • CRYPTOCARD Corporation	16
DeBabelizer • Equilibrium	20
Digital Storage Manager • Meta Communications	25
Domain Registration • MacTech Domains	58
Hosted Store • Brian Loomis	31
iListen • MacSpeech, Inc.	42
Intel Compiler • Intel Corporation	23
Kerio Server Software • Kerio Technologies Inc.	46
KVM • Aten Technology, Inc.	34
Laptop and iPod Cases • MARWARE, Inc.	69
Lasso • OmniPilot Software, Inc.	IFC
Law Offices • Brad Sniderman	68
Long Distance Phone Service • Utilities4Less.com	39
Mac HelpMate • MOST Training and Consulting	47
MacResource Computers • MacResource Computers & Service	61
MacTech Magazine • MacTech Magazine	45
MarketBlast • 4D, Inc.	17
maxemail.com • IGC, Inc. / MaxEMail.com	43
Mobile Juice • JCHS Media Pte Ltd. / Mobile Juice	36
Navicat • PremiumSoft CyberTech Ltd.	56
Now Up-to-Date • Now Software	21
Open Source Directory • MacForge.net	33
Other World Computing • Other World Computing	35, 59, 70-71
Peachpit Press • Peachpit Press	53
Phlink • Ovolab	2
PhonePipe • Tellurium Communications, Inc.	67
Plantronics • Plantronics	63
PowerBook Accessories • QuickerTek	54
RadTech • RadTech, LLC	13
RAM and Memory • BetterRAM.com	66
Screen Protection • Protective Solutions Inc.	69
SDLT Drive • Quantum Corporation	55
SpiderWorks ebooks • Spiderworks	65
StuffIt • Allume Systems, Inc.	BC
StuffIt • Allume Systems, Inc.	4
StuffIt • Allume Systems, Inc.	27
StuffIt • Allume Systems, Inc.	57
Test Track Pro • Seapine Software, Inc.	49
Timbuktu • Netopia, Inc.	19
VirusBarrier • Intego, Inc.	9
Windows IT Pro • Windows IT Pro	51

The index on this page is provided as a service to our readers. The publisher does not assume any liability for errors or omissions.

How to Stop Racing the Clock.



☐ Work Longer? ☐ Work Harder?

☒ Energize Your Mac!

We know your day keeps getting longer and longer. With every release of software, your Mac is bogged down even more. With every click, there's a pause. You find yourself working longer, working harder. *A faster Mac means that you can work faster, not harder - be more productive!*

Let the original Mac Performance Shop help. Daystar has been creating Mac speed for over 16 years. Whether your bottleneck is storage, connectivity or just raw CPU speed, we deliver the performance you need, where you need it.



CPU Upgrades for Raw Speed. We upgrade any Power Macintosh, any iMac Flat Panel, any PowerBook G3 and some PowerBook G4s.

Fast and Large Storage for Real-Time Video. Our **TURBOSATA** solutions can make your drives perform like RAM. Projects open in a flash and edit in real-time.

Extreme Wireless. Wireless is great, unless you're getting slow transfers. Even Airport Extreme's are slow when the signal is weak. Daystar can boost your signals and energize your wireless network.

But, if You Really need a G5? Daystar is the only Mac Performance Manufacturer that is also an Apple Authorized Reseller. Not only can you trade-in your system for the latest and greatest... but the Daystar Pro's can upgrade it for maximum performance!

Call 877-439-8646 and beat the clock.



Authorized Reseller



Daystar Technology - Your Macintosh Performance Shop
5018 Bristol Industrial Way, #202, Buford, GA 30518 USA
Toll Free: 877-439-8646 or 770-614-5400

Daystar-Tech.com

Daystar-Forum.com

Daystar-Store.com

THINGS MADE IN CHINA

COMPRESSED BY

STUFFIT DELUXE

SOFTWARE FOR MAC/PC

